A McGRAW-HILL PUBLICATION

Chemical Week



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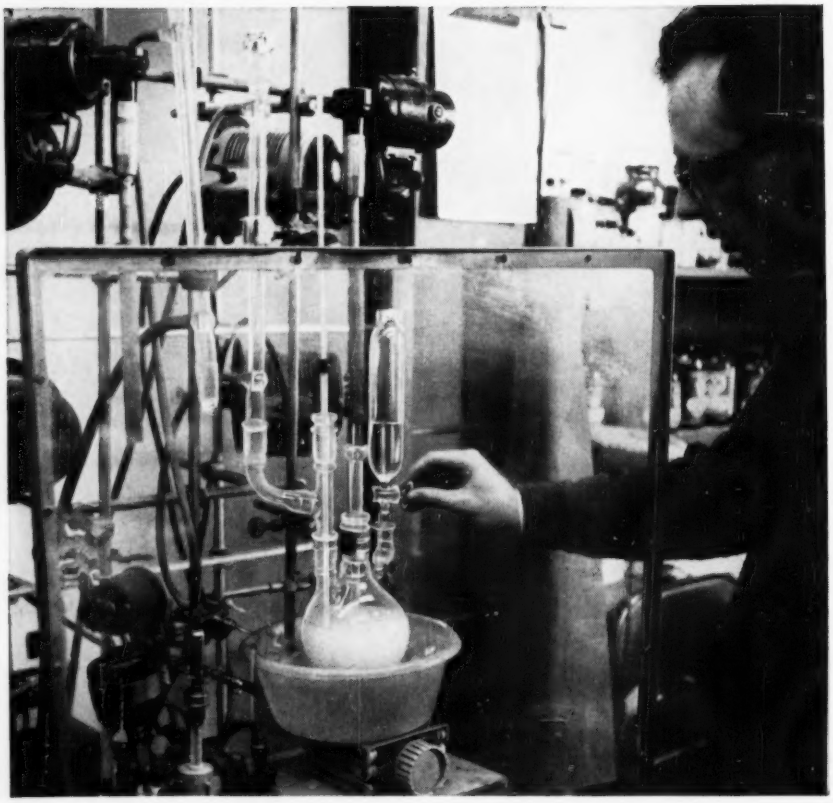
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July 11, 1959

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- ☐ See attached letter on my problem.

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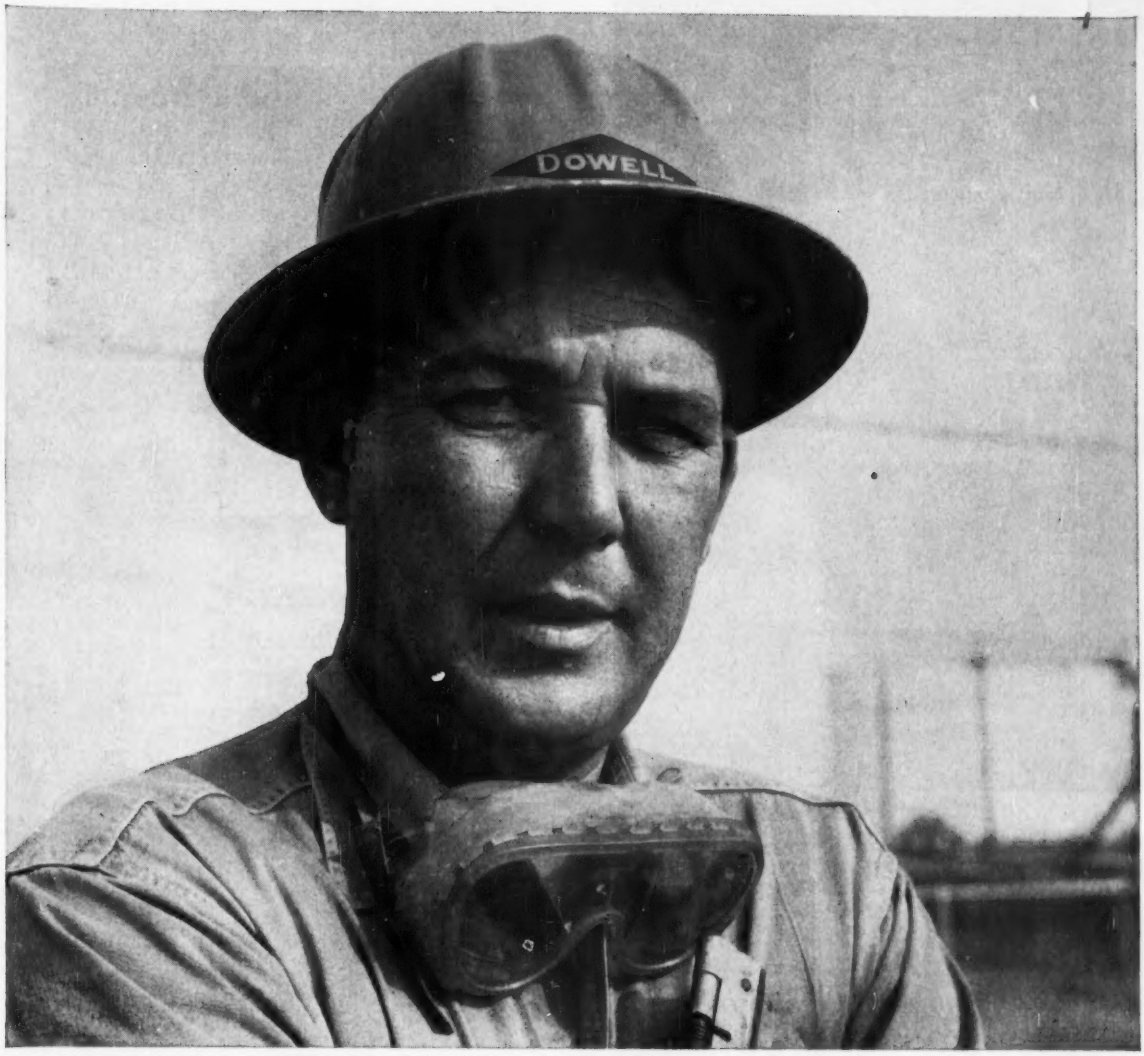
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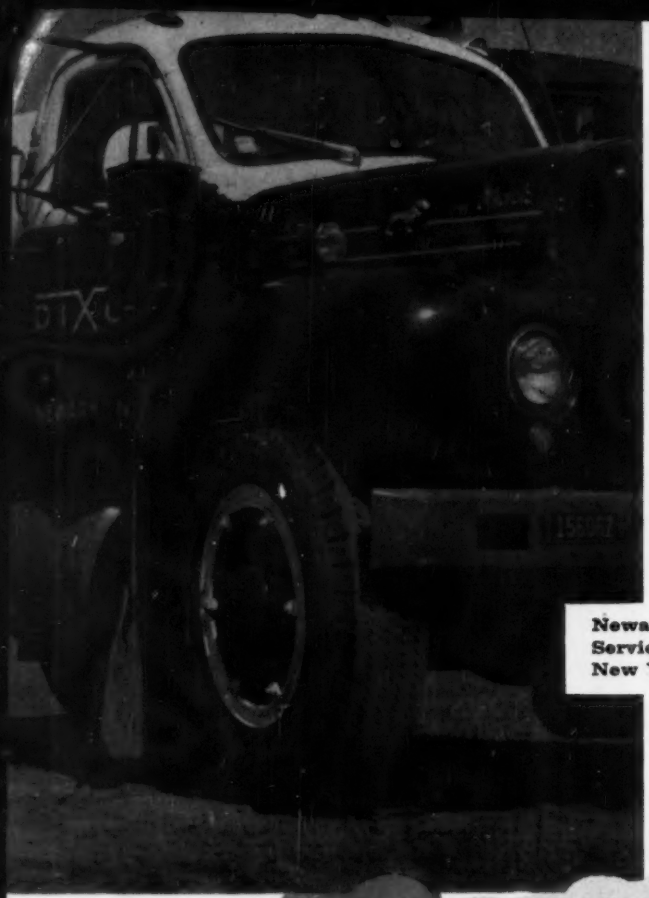
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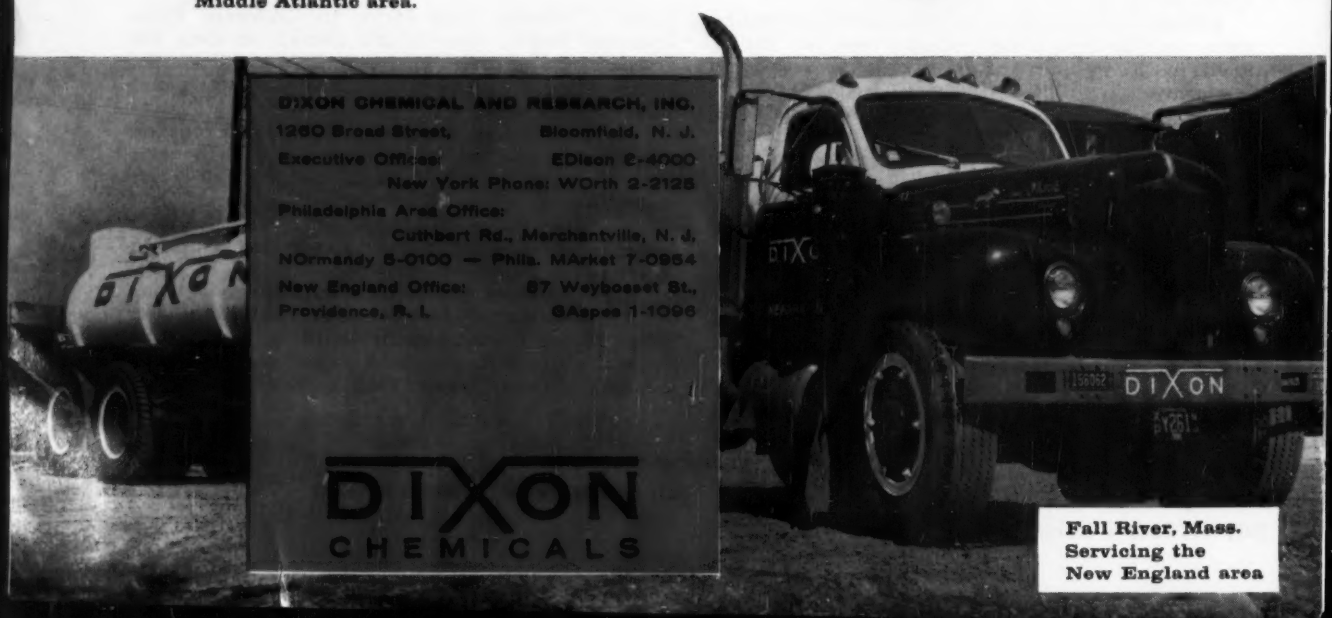


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CHEMICALS

Chemical Week

TOP OF THE WEEK

JULY 11, 1959

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Ohio River valley communities plug anew for chemical plants, take chemical executives on two-day site-seeing jaunt..**p. 73**

Producer's tie-in with co-op, threat of Canadian competition troubles U.S. potash producers .....**p. 87**

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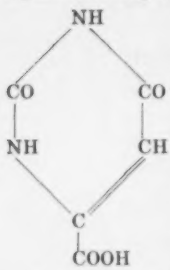
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...AMONG SOME 3700 ORGANICS

Acido orotico

Around the turn of the century it was brought to the world's attention that the inhabitants of certain Bulgarian villages were a) living to ripe old ages and b) consuming vast quantities of the ripe old fermentation products of the local dairying. Echoes of this coincidence have rumbled forth at intervals since.

In the twenties a certain elderly biochemist who had seen much importance in the correlation was a celebrated figure of Paris. In the thirties American milk wagons were bedizened with signs advertising a certain brand of fermented milk. In the forties the word "yogurt" entered the vocabulary of the American intelligentsia. With the dawn of the fifties, the Journal of the American Chemical Society (*72*, 2312) reported that certain strains of *Lactobacillus bulgaricus* throve when supplied with 6-carboxyuracil, a substance first synthesized in 1897 for academic exercise and later shown to be identical with orotic acid. This name was derived from ορος, whey, by two Italians who had encountered the substance while making lactose from milk whey liquors.



The flowering of biochemical sophistication in the mid-fifties has excited a deeper curiosity about orotic acid. To some it looks like a significant intermediate in the process by which living organisms fabricate nucleotides for their DNA—the stuff of genes —out of the amino acids at their disposal. This is big talk.

In Italy interest in *acido orotico* has been rekindled to a small-scale frenzy. At the University of Urbino last June a colloquium on pyrimidines (*Acta Vitaminologica, 12*, 195-328) devoted much of its attention to the compound. One man claimed his evidence showed that a dietary deficiency of orotic acid affects pregnancy, lactation, and growth in the rat, that it is a vitamin-like factor essential for the survival of the newborn. One senses the closing of a circle.

If we had not been invited to quote on 100 kilos of *Orotic Acid* recently, we might not have looked up all this lore. We didn't get the order, but in trying we made enough of it to stock as Eastman 7784 (along with *2-Thiooorotic Acid*, Eastman 7783) for the convenience of biochemical investigators. Anybody who wants to sell it from milk trucks is strictly on his own.

Apology

In Analytical Chemistry (*30*, 365) appeared a paper on *2,3-Quinoxalinedithiol* (Eastman 7317) as a colorimetric reagent for nickel. It appeared exactly one year after our advertisement in the same journal had announced availability of the compound with the remark, "Soon doubtless, somebody will publish a procedure employing this as a more sensitive and/or more convenient and/or more foolproof reagent for nickel." To the authors who turned up to fulfill our prophecy we apologize for our hot breath on their necks. We can send an abstract of their procedure to all who ask.

The chelatometrist and the gas chromatographer should be our friends

Though these lines were written on a chilly evening in April, they are very likely being read when it's too hot for tedious ruminations on chelatometry and gas chromatography. All we want to do is hop on the bandwagon, both bandwagons. Between the writing and the reading, Hahnemann Medical College & Hospital honored Chelation on May 6, 7, and 8 by a capital "C" and a symposium on "Metal-Binding in Medicine"; and many a laboratory which had no gas chromatograph in April had one by July. When these things pick up momentum, none dare stand in the way.

And why should we fear either of these powerful new passions that stir chemists?

What is a chelatometric indicator but a colorimetric reagent which will permit (*Ethylenedinitrilo)tetraacetic Acid Disodium Salt* (Eastman 6354, "EDTA") to rob it of its metal ions under specified conditions? Are we not widely admired for the reliability of our colorimetric reagents? Have we not refrained from listing a colorimetric reagent as a chelatometric indicator without first finding a literature reference to such use? Do we not even proselyte for chelatometry by offering copies of a list of Eastman Chelatometric Indicators covering

aluminum	chromium	lead	platinum	sodium	titanium
barium	cobalt	magnesium	plutonium	strontium	uranium
bismuth	copper	manganese	potassium	sulfur	vanadium
cadmium	gallium	mercury	rare earths	thallium	yttrium
calcium	indium	nickel	scandium	thorium	zinc
cerium	jron	palladium	silver	tin	zirconium ?

Of course we do.

As for gas chromatography, should we be dismayed that 30¢-a-quart motor oil on ground firebrick can exhibit a differential in delay time for the components of a vapor mixture? That corn flakes or one of the popular four-letter household detergents can work? Can any serious chromatographer, mindful of the need for breadth of choice in stationary-phase liquids to fit instantly the largest variety of chromatographic occasions, doubt the wisdom of at once ordering

929 Benzyl Ether
3035 2-(Benzyloxy)ethanol
4738 Bis(2-ethoxyethyl) Ether
P4739 Bis[2-(2-methoxyethoxy)ethyl] Ether
P6447 Di-n-decyl Phthalate
1968 N,N-Diethylformamide
5870 N,N-Dimethylformamide
2627 n-Propyl Sulfone
7311 Squalane
5404 Tetra-iso-butylene
P4770 Tri-iso-butylene
T4420 Tritolyl Phosphate . . . ?

He can, but he shouldn't. A purchase order for $34.30 would fetch him the whole group, including enough of even the more expensive ones to treat a column of packing.

Have it made out to Distillation Products Industries, Rochester 3, N. Y. Whoever wants to fuss around with *List No. 41* looking up individual items among more than 3700 Eastman Organic Chemicals we offer or wants the chelatometric list or the Ni abstract should write to the same address.

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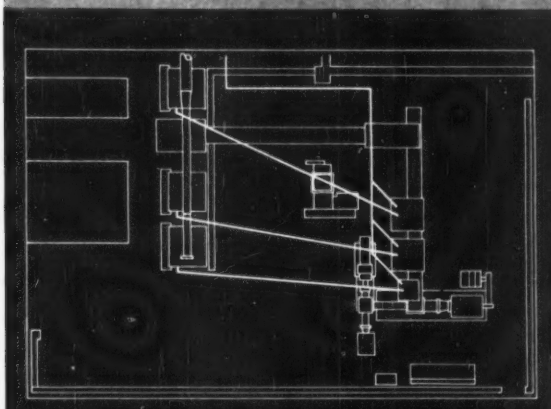
Distillation Products Industries *is a division of* **Eastman Kodak Company**

FORD MOTOR COMPANY
installs BAKER PERKINS machinery for
continuous production of re-inforced plastic pre-mix

To achieve all the advantages of automatic processing, Ford Motor Company has installed a completely integrated system for the production of re-inforced plastic pre-mix on a continuous basis. A Baker Perkins Ko-Kneader has successfully solved this tough mixing problem and is the key piece of equipment in the system. Because of this remarkable technical accomplishment, it has been possible to achieve a whole new concept in automated pre-mix production. Baker Perkins supplied all the auxiliary equipment for conveying, weighing and feeding the component materials which included resin, sisal, clay, asbestos and calcium carbonate, as well as the equipment for forming and cutting off the pre-mix after discharge from the Ko-Kneader.

The machines of Baker Perkins manufacture in this installation include: four dump hoppers, complete pneumatic conveyor systems, belt transfer conveyor, resin pump and a model K-250-IM Ko-Kneader.

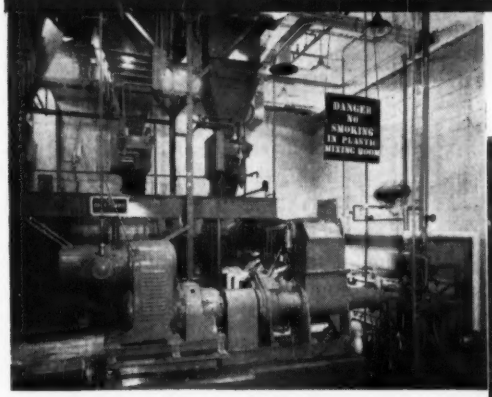
With this new automated system, Ford Motor Company has been able to capitalize on all the advantages of continuous processing and achieve a production rate of 1800-2400 lbs. of high quality pre-mix per hour. You, too, may be able to utilize the many advantages of the Ko-Kneader for continuous processing. Why not write today for complete information.



This diagram illustrates the continuous mixing system as installed at Ford Motor Company.

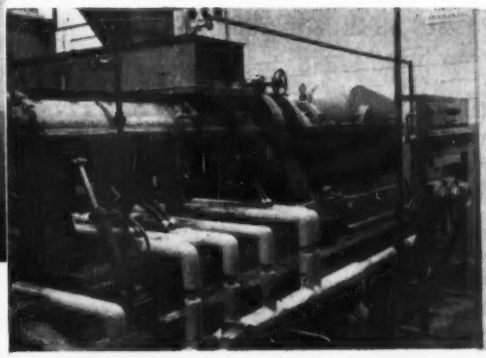


From these B-P dump hoppers the asbestos, clay and calcium carbonate are conveyed by a Baker Perkins pneumatic system to the mixing room. The sisal (second from the left) is moved by a mechanical conveyor.



Close up view of the Baker Perkins model K-250-IM Ko-Kneader. Feed conveyor is at the top, center. Discharge is at extreme lower left.

Overall view of mixing room. The overhead feeders discharge measured amounts of material on conveyor discharging into the Ko-Kneader.





See our insert in Chemical Engineering Catalog for additional information.

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Cable tool rig lowers tubing into brine well. Photo by Loebel.

International adapts oil-drilling technique to "bring in" new brine wells

Mining engineers and geologists at International Salt Company have found a new, accurate method of pinpointing underground brine cavities. Called directional Hydraulic Fracturing, the method was originally developed by the oil industry. It represents the first major advance in the hydraulic mining of salt in over a century.

In Hydraulic Fracturing, two holes, as far apart as 1,000 feet, are drilled deep into a salt bed. Water is forced down one hole under high pressure (up to 5,000 psi). The salt bed fractures rapidly toward the second hole, or target well. Under continuing pressure, brine is forced horizontally along this fracture into the target well and is then pumped to the surface for evaporation.

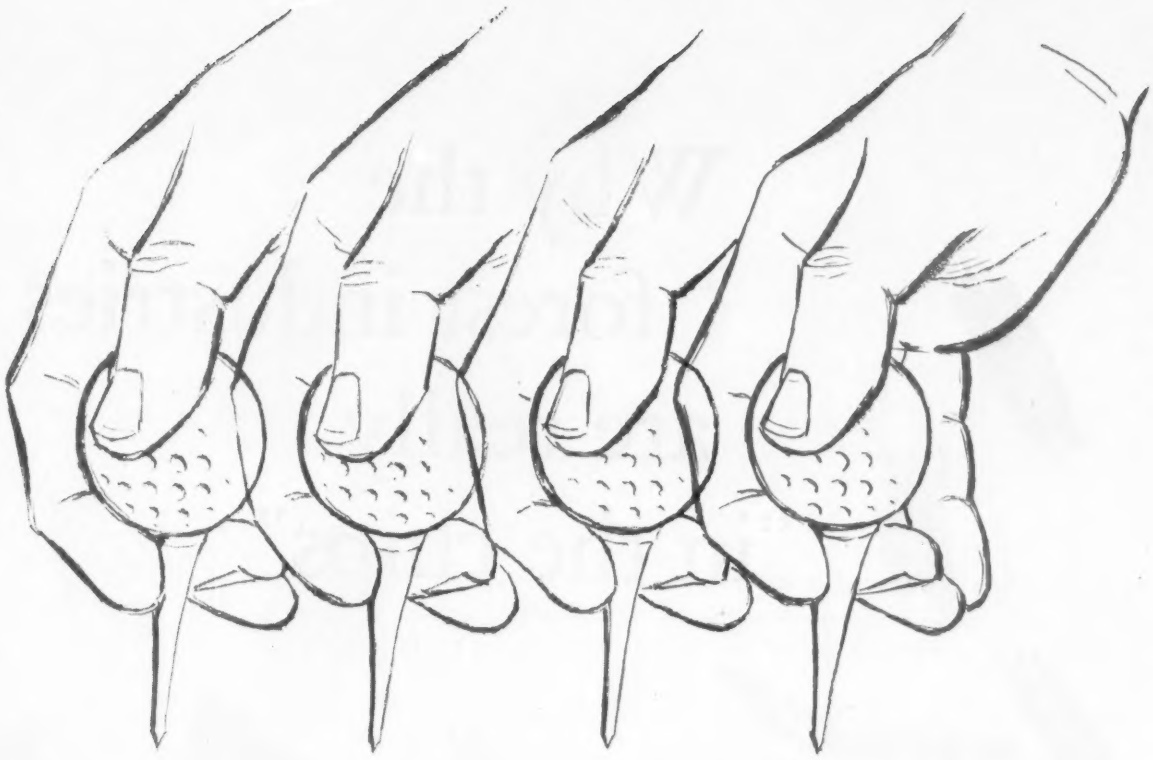
Now in operation at two of International's New York State refineries, Hydraulic Fracturing allows fast, controlled development of large underground brine fields. The new process also assures a long-lasting supply of concentrated brine from individual wells.

You can benefit from International's many advances in salt technology and engineering. Simply contact International Salt Co., Inc., Scranton, Pa., or any of the offices listed below.

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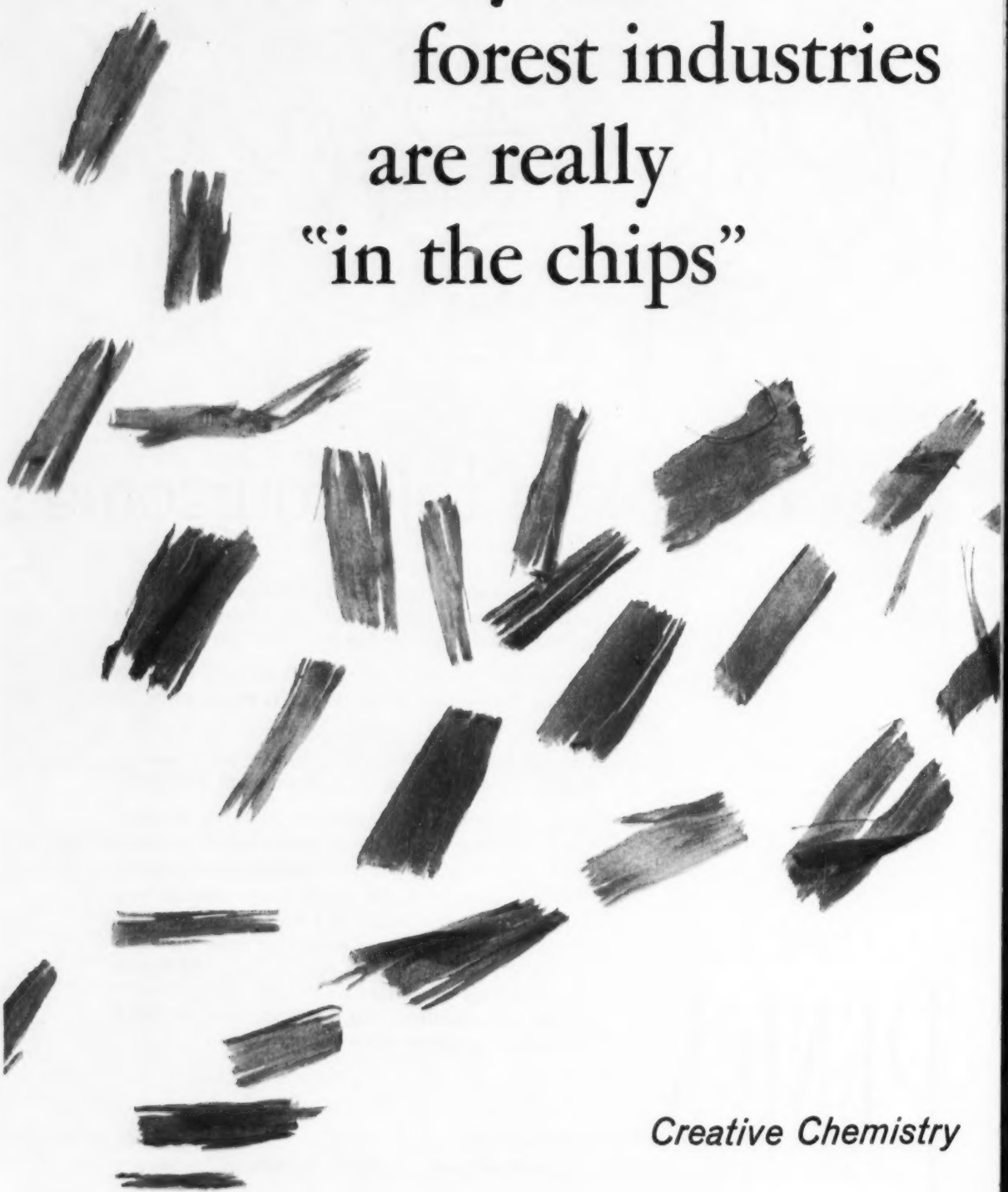
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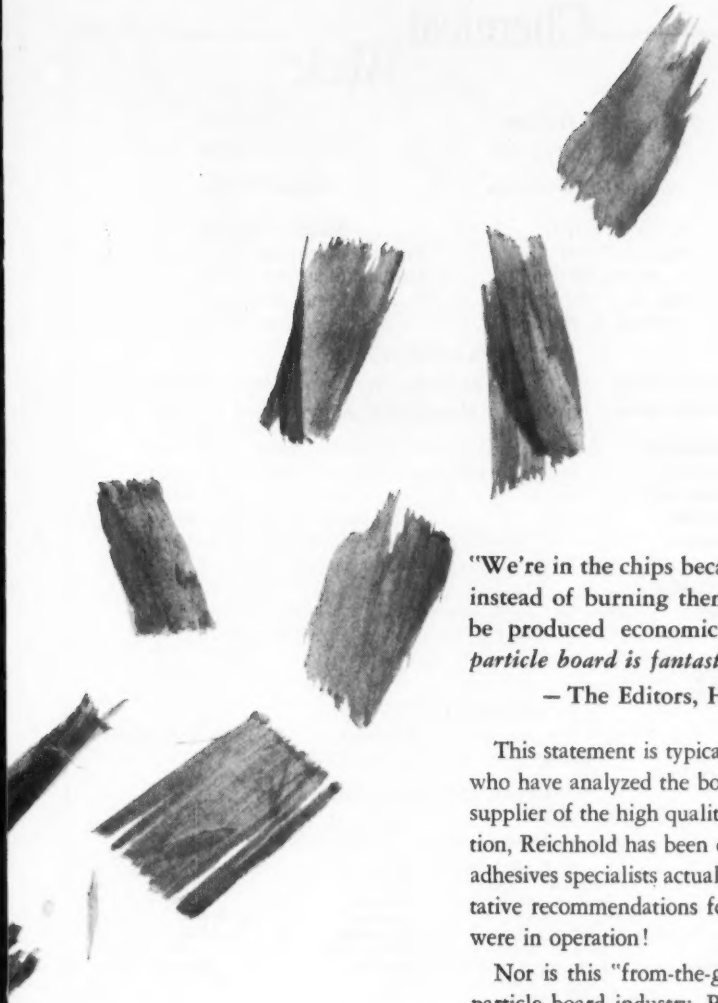
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Why the forest industries are really "in the chips"



Creative Chemistry



"We're in the chips because, for one thing, we've learned to use chips instead of burning them! We've discovered a new product that can be produced economically and in great quantity. *The future of particle board is fantastic!*"

— The Editors, Hitchcock's WOOD WORKING (italics ours)

This statement is typical of the observations made by editors and writers who have analyzed the booming particle board industry. And as a principal supplier of the high quality bonding agents so vital in particle board production, Reichhold has been closely involved in this success story. In fact, RCI adhesives specialists actually studied requirements and came up with authoritative recommendations for a number of manufacturers *before* their plants were in operation!

Nor is this "from-the-ground-up" participation by RCI restricted to the particle board industry. Plywood production and furniture-making are two more areas in which Reichhold's broad experience and full line of adhesives have been put to good use by manufacturers — time and again, to help solve a wide variety of problems.

This concept of total service on the part of the forest industries' suppliers is a vital ingredient in maintaining dynamic growth. It helps explain, too, how Reichhold's "creative chemistry" has indeed been a "partner in progress". Many times over! And RCI will continue to be a partner — *your* partner, possibly — in the success stories that are waiting to be written in the "skyrocketing" sixties!

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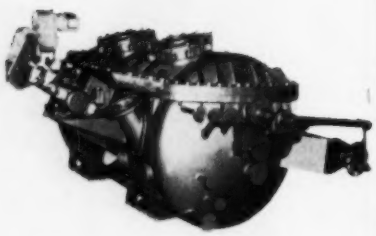
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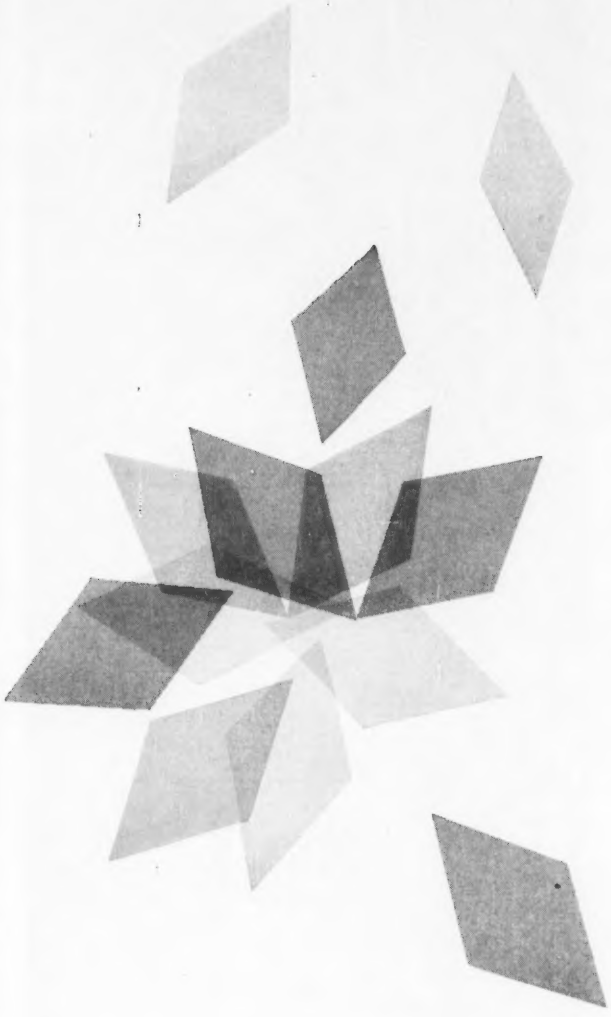
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OPINION

Opportunities in India

TO THE EDITOR: I have just read your article "Exploring the CPI's New Frontiers" (*June 13, p. 27*) and I hasten to express my appreciation of the excellent and fair manner in which you have assessed investment opportunities in underdeveloped countries for American businessmen. I not only appreciate the sympathetic treatment you have accorded India but also hope that this article will help convince American businessmen of the vast opportunities that exist for profitable investment in India's chemical industry.

With reference to your observations on the "red tape tangle," as you call it, I would point out that we are already taking steps to minimize the time consumed in processing the applications for licenses. Such delays as have occurred in the past have arisen largely from difficulties in fitting the particular projects into the over-all developmental plans. Our aim indeed is to process the licensing arrangements with "all deliberate speed." Prospective investors can also help in speeding up the process by adequate preparation . . . in the light of India's policies.

N. PATTABHIRAMAN
Assistant Director
Consulate General of India
New York

Oxygen in Acrolein

TO THE EDITOR: We are indeed flattered and appreciative of your continued interest in our acrylonitrile process. However, we wish to call your attention to a substantial inaccuracy in the article (*May 30, p. 70*).

In referring to our Belgian patent No. 568,481, you say that it describes the production of acrolein from propylene and ammonia by essentially the same method as disclosed in our Belgian patent No. 571,200. The plain inference is that the patents are related, whereas the contrary is true. Even the most casual consideration of the chemistry involved in the manufacture of acrolein makes it apparent that an oxygenated derivative of propylene cannot be obtained by reacting materials that do not contain oxygen. More important, though, our Belgian patent No. 568,481 has nothing whatever to do with the manufacture of acrylonitrile and does not even mention ammonia. The latter patent describes a process for producing acrolein by reacting propylene and oxygen. . . .

LELAND L. CHAPMAN
The Standard Oil Co.
Cleveland

We erred by saying "ammonia" rather than "oxygen." It can be contended, however, that the patents are related, since routes have been described for going from acrolein to acrylonitrile.—ED.

Both on the Sabine

TO THE EDITOR: Your "Plastic Film Outlook" article (*May 9*) states that "Spencer will bring in a 100-million-lbs./year polyethylene unit in Longview, Tex., later this year."

To set the record straight, we recently announced plans to substantially expand the capacity of our Orange, Tex., works. However, we do not have nor are we planning any operations in Longview, Tex.

FRANK L. PYLE
Vice-President
Spencer Chemical Co.
Kansas City, Mo.

It is Eastman, of course, that is expanding at Longview.—ED.

MEETINGS

Gordon Research Conferences: At Colby Junior College, New London, N.H.—textiles, July 13-17; corrosion, July 20-24; organic coatings, July 27-31; medicinal chemistry, Aug. 3-7. At New Hampton School, New Hampton, N.H.—organic reactions and processes, July 13-17; microbiological deterioration, July 20-24; radiation chemistry, July 27-31; steroids and related natural products, Aug. 3-7. At Kimball Union Academy, Meriden, N.H.—chemistry, physiology and structure of bones and teeth, July 13-17; cell structure and metabolism, July 20-24; chemistry at interfaces, July 27-31; biochemistry and agriculture, Aug 3-7.

American Soybean Assn., 39th annual convention, Sheraton-Jefferson Hotel, St. Louis, Mo., Aug. 11-12.

Technical Assn. of the Pulp and Paper Industry, 10th testing conference, Multnomah Hotel, Portland, Ore., Aug. 18-21.

VIEWPOINT

THE SOVIET TRADE FAIR, which opened in New York last week, has already been visited by many chemical industry people. They are not impressed.

Some of the industrial exhibits—the animated steel-plant models, an over-water oil drilling rig, and a butadiene-from-butane unit—are gems of the model makers' art. But as a display of the best of the Soviet chemical industry, the show is a bust.

Take that butadiene-from-butane showpiece, for example. It uses a fluid bed for the dehydrogenation. One engineer who questioned Russian technologists through an interpreter, was given the general range of operating conditions—which are roughly equivalent to published data on non-fluid-bed U.S. units.

If this is true, to quote one expert, "the Russians have solved some grave engineering problems."

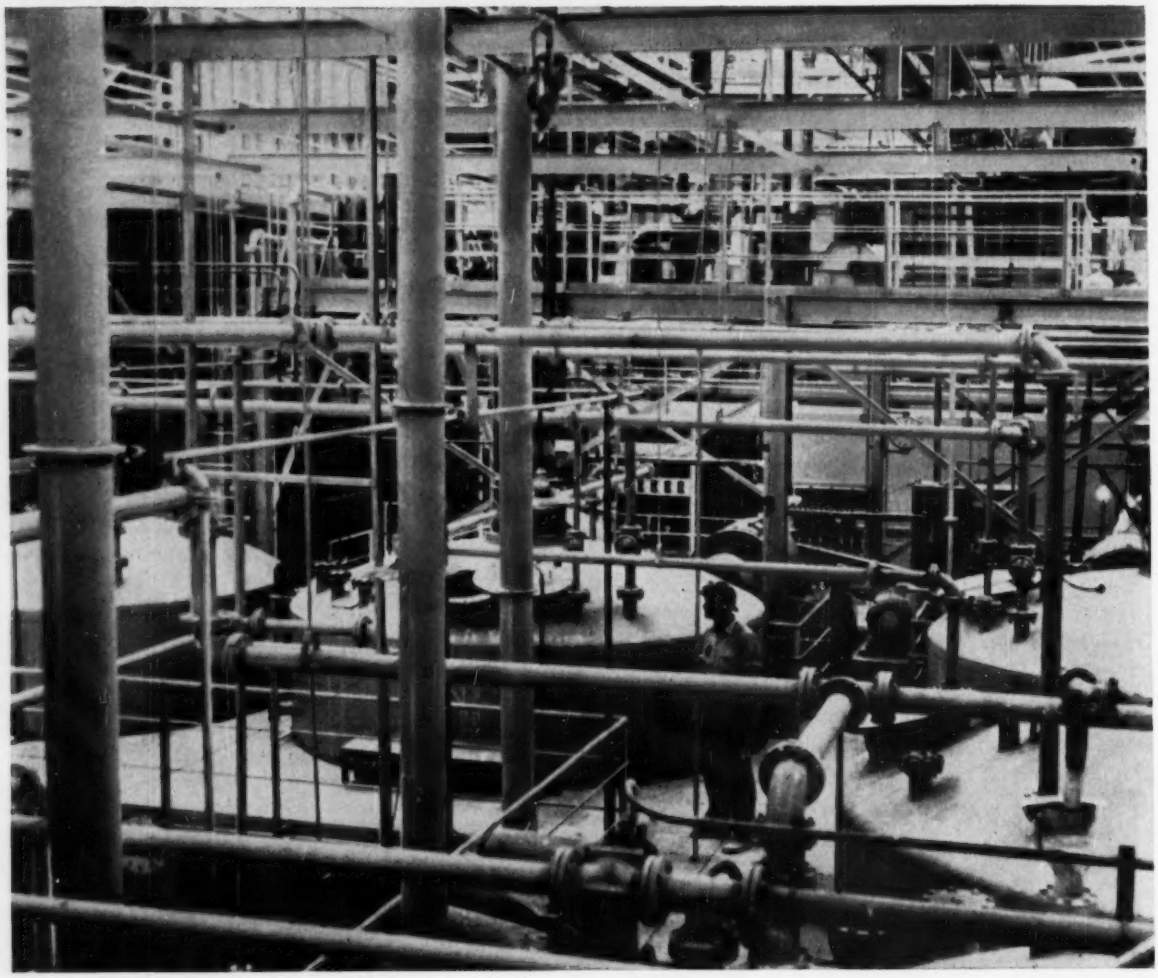
It's well known, of course, that in synthetic rubber, as in so many other fields of technology, the Russians did it first. They say that the first commercial butadiene rubber plant started operation in Yaroslavl on July 7, 1932. And in the 27 years that followed, they've improved their processes.

But then, why is dehydrogenation technology one area in which the Russians are trying hard to buy U.S. know-how? Apparently, the "grave engineering problems" of fluid-bed dehydrogenation must still not be completely solved. Showpiece?

The Russians have inadvertently underscored the fact that even for their prized plants, they still need U.S. know-how. Since obtaining such information is a major objective of the current visit of the Soviet Union's First Deputy Premier Kozlov, CHEMICAL WEEK plans careful coverage of the Russian official's stay. A CHEMICAL WEEK staffer is one of the ten newsmen accredited by the State Dept. to accompany Kozlov on his cross-country tour of U.S. industry. Look for his forthcoming reports.

H. C. Johnson
Editor-in-Chief

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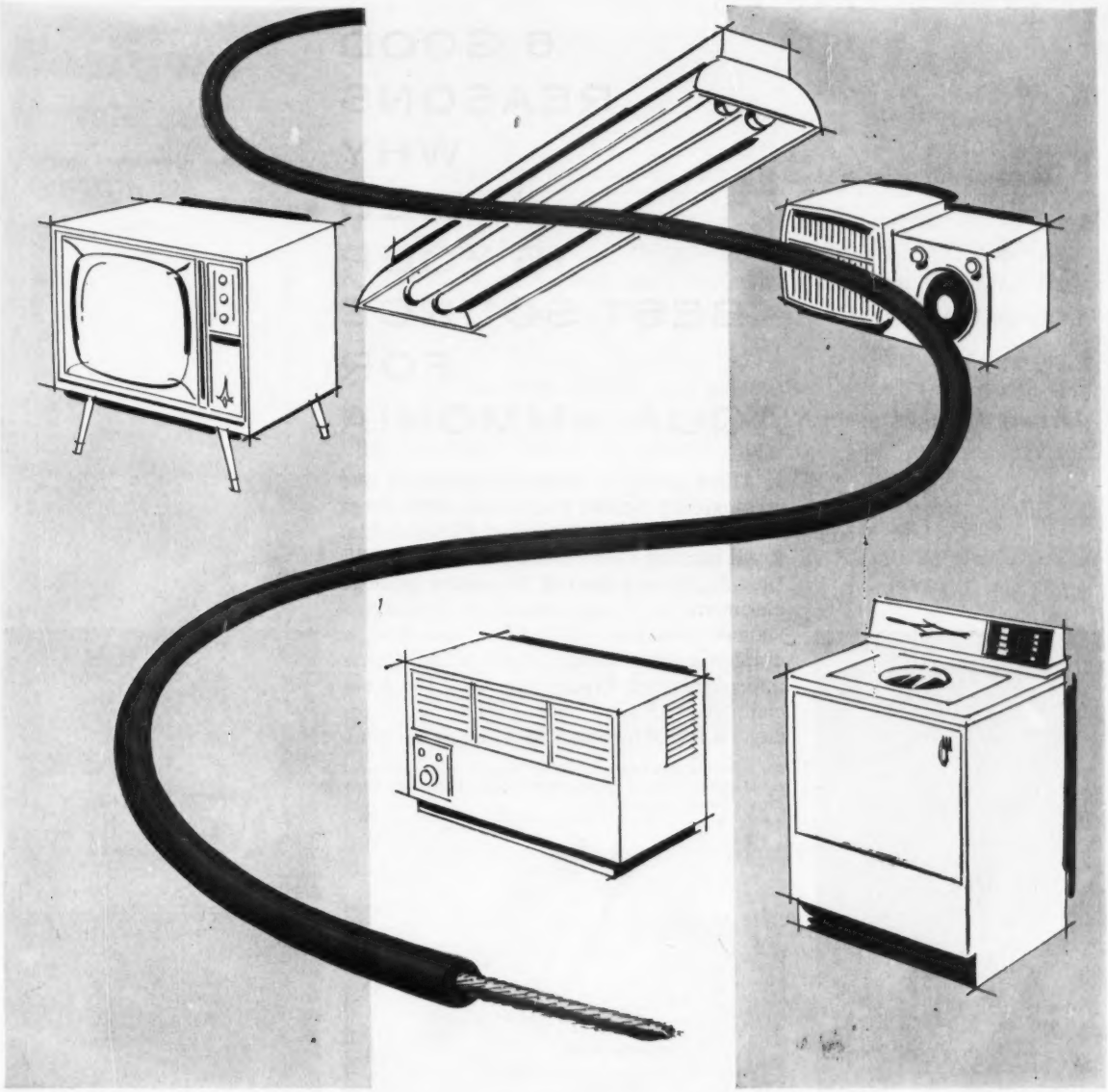
The maze above is of Saran Lined Pipe, and is a part of the process piping at American Cyanamid's Savannah plant, Savannah, Georgia. Most of this pipe carries process liquors with a sulfuric acid content of 25% . . . at temperatures of 165° F. and above. Pumping pressures range upward to a maximum of 70 psig.

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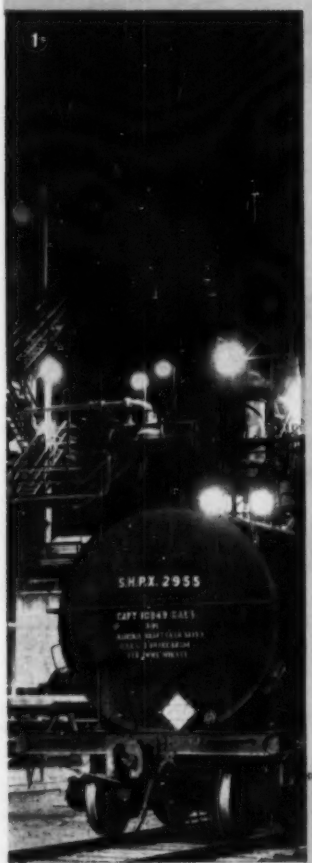
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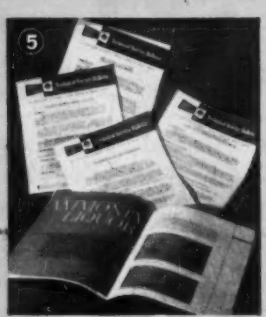
For specifications and local offices, see our insert in Chemical Materials Catalog, pages 435-442 and in Chemical Week Buyers Guide, pages 35-42.













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Business
Newsletter

CHEMICAL WEEK
July 11, 1959

You may be wooed by a Russian trade mission this month.

U.S. chemical, equipment and engineer concerns are being approached by a Soviet trade delegation. It's headed by M. R. Kuzmin, the Soviet's deputy minister of trade, and includes chairmen of 10 large Soviet trading organizations—primarily in the heavy machinery and equipment fields.

One of the group's first moves was to send a three-man team to Wilmington, Del., for talks with Du Pont representatives. Du Pont confirms that there was a conference lasting more than an hour, but adds that the upshot of the visit was "no sale."

In Washington, U.S. government officials expressed "mild interest" in these new overtures being made by the Soviet Union and its Amtorg trading agency. One official notes that Amtorg never takes "no" from a prospective buyer or seller, keeps after him with mail, etc.

It's probably not just coincidence that this new Amtorg drive is being launched while Deputy Premier Frol Koslov is touring the country this week, striving to impress businessmen with the theme of "peaceful coexistence through trade." The *CW* editor traveling with Kozlov's aircade reports that this line is finding favor with some U.S. industrialists. But State and Commerce Dept. officials still say that there's not much potential in the limited U.S.-Russian trade permitted under security regulations.

•

Dow Badische will make acrylic acid and esters at its acetylene chemicals plant near Freeport, Tex. The joint-venture company is expected to be in production by January on a site adjacent to Dow Chemical's Texas Division works. Construction has been in progress the past eight months. Dow Badische's other corporate parent is BASF Overzee N.V., a subsidiary of Germany's Badische Anilin- & Soda-Fabrik.

Acrylic acid, the company says, will be produced as a 94% technical grade "by a direct process developed by Badische and believed new to the U.S."

Acrylic esters—methyl, ethyl, butyl and others—will be made by esterification with the corresponding alcohols.

•

Celanese Corp. is plunging deeper into rocket fuels—despite the uncertainties of this fast-changing business (*see p. 23*).

Following its move to organize a high-energy materials team last spring (*CW, April 11, p. 24*), Celanese last week:

• Purchased a virtually unused propellent plant that was built on a 1,300-acre tract at Asheville, N.C., in 1953 by Oerlikon, a Swiss concern. The latter has been building rockets for various countries, never got contracts in the U.S.

• Set up a new company—Amcel Propulsion, Inc.—to own and operate the plant. Celanese is definitely the controlling owner; other U.S. interests—so far unidentified—hold minority shares.

•

Calmer weather has returned to some turbulent labor situations this week.

A bitter strike at Virginia-Carolina's phosphate plant in Bartow, Fla., has taken on legal overtones—with no recurrence of gun brandishing or rioting (*CW Business Newsletter, July 4*).

There, 10 members of International Chemical Workers Union local were enjoined from using violence to enforce picket lines. Immediately, the union filed a countersuit alleging acts by the company "impelling them to quit or strike." The company, denying the charges, asked Judge Gunter Stephenson to throw out the union's suit on the ground that the allegations come under jurisdiction of the National Labor Relations Board.

The Oil, Chemical & Atomic Workers have okayed a two-year pact at Mobay Chemical's New Martinsville, W.Va., plant and are reportedly near agreement on another for the Union Carbide Metals plant at Alloy, W.Va. No details of either contract were revealed.

In addition, a new wage contract for employees of National Carbon's plant at Clarksburg, W.Va., was agreed on minutes before a midnight strike deadline. Terms call for a 10¢/hour boost for 485 workers, additional increases for tradesmen and inspection workers.

And the ICWU strike at the Great Lakes Carbon Co. plant at Morganton, N.C., ended after two months of stress. Terms were not revealed, except that newly hired employees and strikers who returned to work during the strike will continue on their jobs, with seniority.

•

But a strike on the inland waterways is slowing chemical traffic. The stoppage hit major common carriers (shipments by contract carriers are not affected). Inventories in some chemical firms have been built up to last out a four-week strike. In a spot-check, *CW* found traffic managers supporting barge-line efforts to prevent an inflationary wage increase. A big wage boost, they said, could raise barge rates to the point where traffic would be diverted to rail, tend to eliminate competition between rail and water carriers.

•

Beryllium Corp. is moving to clinch a share of a new market. It is setting up Consolidated Beryllium Ltd., as a 50-50 joint venture with Imperial Smelting Corp. Ltd., a subsidiary of Consolidated Zinc Corp. (London, Eng.). The new company plans to build in England what it terms "the largest beryllium plant in the world." Britain's power reactor program is expected to require more than 200,000 lbs./year of nuclear-grade beryllium metal.



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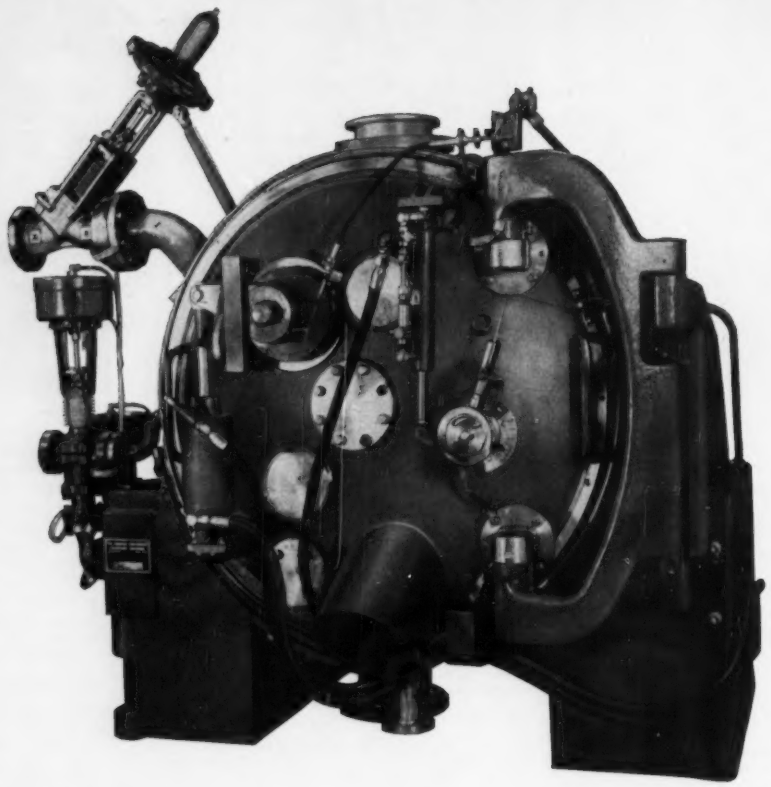
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Chemical Week — July 11, 1959

Boron Fuels at the Crossroads

Who—if anyone—will get the big contracts, one or two years hence, for large-volume production of high-energy fuels? The answer to this far-reaching question may be largely determined by an 18-month study project now being launched by Arthur D. Little, Inc. (Cambridge, Mass.).

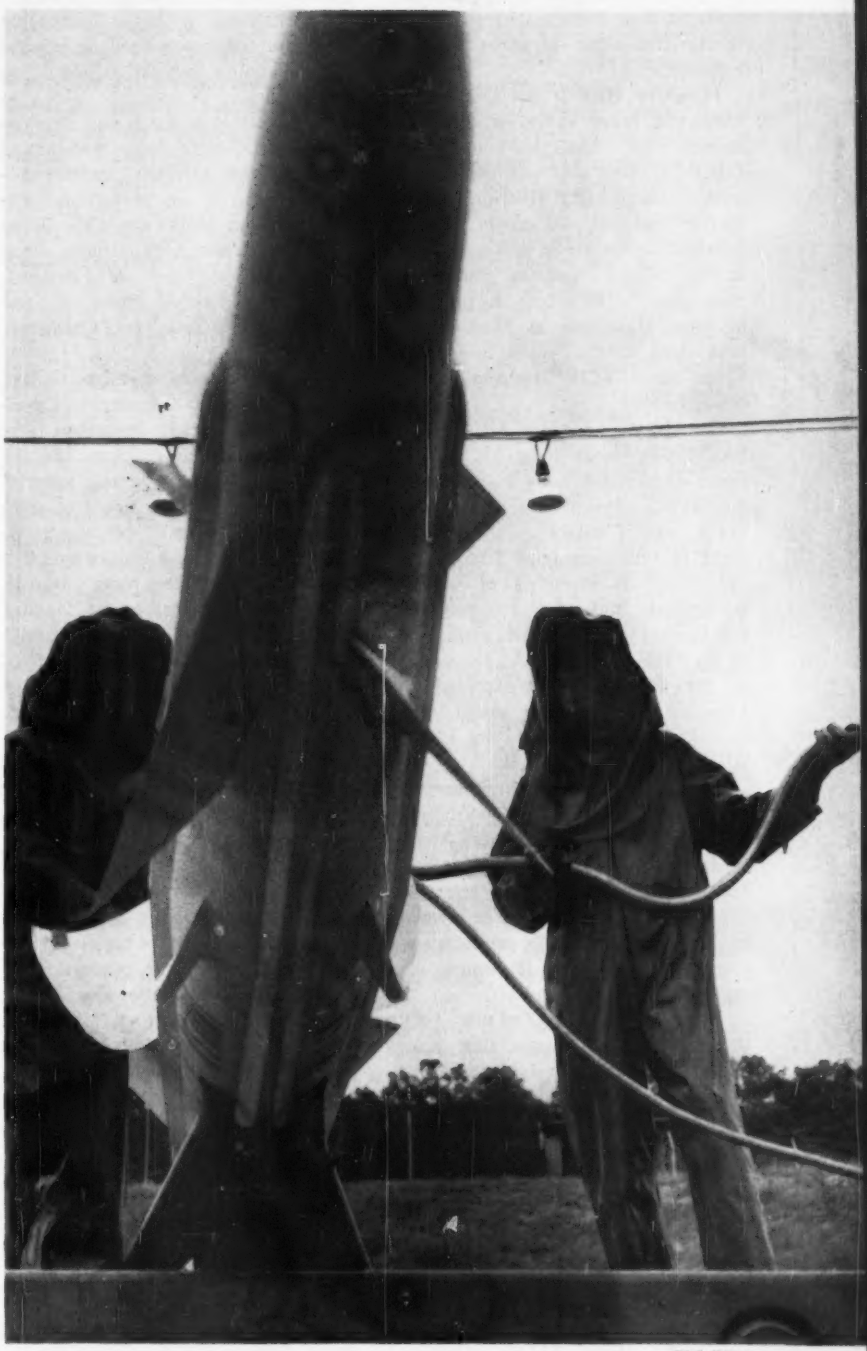
This survey task—assigned to Little last month by the U.S. Dept. of Defense—involves scrutiny and evaluation of all the most promising boron-based fuels and processes for making them. Thereafter, Little is to make recommendations on the most economical means of producing the most efficient boron fuels. These findings—coupled with prevailing military considerations—will serve as guides in formulating production plans.

Special Two-Plant Study: Also, the Defense Dept. has awarded Little a contract for a 60-day study to compare the two principal existing boron fuel plants: (1) the $45-million Air Force plant contracted to Olin Mathieson at Model City, N.Y.; (2) the $38-million Navy plant contracted to Callery Chemical at Muskogee, Okla. The consulting firm will recommend which of these two plants should be operated, if it's decided to keep only one in production.

Both plants are designed to produce trialkyl decaborane (HEF-3) at the rate of 5 tons/day, and both are slated to start up during the next two months; but it would probably take nearly a year to get them into full production.

When the contracts for these plants were let several years ago, it was expected that the fuel would be needed by both the Navy and Air Force. Now that the Air Force has largely taken over responsibility for long-range missions, the Navy has little use for this kind of fuel.

The Navy plans to operate the Muskogee plant through '59, but would like the Air Force to take over thereafter. Defense Dept. planners are reported to be of the opinion



WIDE WORLD

Fueling up: New study will help settle fate of boron propellents.

that the Air Force should control both plants, inasmuch as it will be the prime user of HEF-3. The Air Force, on the other hand, reportedly believes that it will not need both plants' output.

The 60-day Little study stems from the assumption that it would probably be more economical to operate one plant at near full-capacity rate than to run two plants at about 50% of capacity each.

Finis for HEF-2: All this closely follows a Navy move to end production of trialkyl pentaborane (HEF-2). One step was the sudden termination of Metal Hydride's $13.5-million contract to supply sodium borohydride for use in making HEF-2 at the Navy's "interim production pilot plant." This unit is operated by Olin Mathieson at Model City, next door to the much larger Air Force plant (*CW Business Newsletter, July 4*).

The Navy has now turned that Model City plant over to the Air Force—which takes the Navy out of the HEF-2 picture entirely. The Air Force says it will keep the HEF-2 plant in operation until late in the fall, when its inventory of sodium borohydride and other intermediates will be used up. Thereafter, employees of the HEF-2 unit will be reassigned to the HEF-3 plant, expected to have a work force of about 600. Beyond December, the future of the HEF-2 plant is undecided.

Another Question Mark: What will happen to the Navy's $4.4-million plant at Danvers, Mass., where Metal Hydrides was producing sodium borohydride up to last fortnight? This plant stands on a site owned by Metal Hydrides, and the company would like to use it if commercial customers can be found.

From startup last October until the shutdown in June, this plant turned out more than 1.7 million lbs. of sodium borohydride—55-60% of the total that would have been shipped if the contract had been allowed to run its full course, to May '60. At this rate, Metal Hydrides was able to supply the material for $3-5/lb. (*CW, Oct. 5, '57, p. 22*). Now the company is looking for customers who could take as much as 20,000 lbs./year apiece—and the price would be about $15/lb. Current spot-sale price of the pure sodium borohydride in small lots is about $33/lb.

Boron Fuels' Future: With HEF-2 doomed and with HEF-3 apparently certain to be in overcapacity within a year, and with controversy now raging as to whether manned, air-breathing aircraft should have more than a secondary role in over-all defense strategy, it might seem that prospects for boron fuels in general are rather dim. But this is not necessarily true.

Considerable research and development work—both under government contract and privately sponsored—is being carried on at various locations by Olin Mathieson, U.S. Borax & Chemical, and AFN (jointly owned by American Potash & Chemical, Food Machinery & Chemical, and National Distillers & Chemical), among others.

Less than two months ago, Callery received a $175,000 contract to evaluate a new rocket propellent that quite likely contains boron. It's described as a noncryogenic material that could have either liquid or solid applications, "permit substantial increases in rocket payload weight."

Just last week, the Navy's Bureau of Aeronautics awarded to Stauffer Chemical a $100,000-plus contract for research on high-energy monopropellents. The Navy says this project will "capitalize on the company's knowledge of boron, fluorine and related elements." This will be Stauffer's third contract for research on monopropellents; the work will be done at the company's Eastern Research Center, located at Chauncey, N.Y.

And Stauffer-Aerojet is proceeding with construction of what it calls a "large pilot plant" for production of high-energy boron fuels near Sacramento, Calif. (*CW, Jan. 31, p. 22*). This was originally reported as a $2-million project, but the cost is now estimated at somewhat more than that sum.

Best guess now is that there probably will be an important military market for such fuels for some years to come. One indication: North American Aviation and its subcontracting partners are going ahead with prototype production on both the B-70 bomber and F-108 fighter plane—both of which will use chemical jet fuels in big volume.

Expanding Abroad

It's no secret to the CPI that producing abroad can be a good way to boost sales. But the current expansion program of Ferro Corp. (Cleveland) lights up a comparatively unnoticed advantage to foreign production—the opportunities to diversify into products that would not pay off in the U.S.

In the U.S. and its 13 overseas operations, Ferro's principal product is enamel frits. It also produces glass fiber, chemicals, colorants, refractory specialties, electrical components, furnaces, kilns, and process equipment.

To launch the new diversification program, Ferro's wholly owned Mexican subsidiary, Ferro Enamel de Mexico, has just begun production of vitrified glass enamels and glass coloring for bottle labels and architectural glass panels. Ferro's Canadian, Argentine, and Australian plants are also getting ready to go into glass colors.

No Present Producer: In the U.S., Ferro de Mexico's President Luis Miguel Aguilar told *CW*, competition in glass colors and enamels is too tough for newcomers. But in Mexico the field is wide open, with no other glass enamel producers on the scene and several major breweries switching away from paper bottle labels.

The new plant can supply the entire market with its 200-tons/day output, and is expected to boost Ferro's Mexican sales 25% to more than $2 million/year. The plant will also supply customers in Venezuela, Chile, and elsewhere, and, eventually, may export to the U.S., despite the tariffs. Glass colors now made in Mexico are about 25% cheaper than colors now imported from the U.S., and 95% of the raw materials—such as lead, silica, feldspar and sodium ash—are in abundant supply.

Potential Supplier to Parent: Already, plans are in the works to expand production in the newly opened Mexican plant, and the company is thinking about diversifying into other products that Ferro would not even consider for U.S. production. One of these is lead oxide, which it might make for captive use and sale in Mexico, and for export to the parent company and other U.S. users. Lead silicate and other compounds used in enamel are also candidates.

Mexico, Aguilar feels, holds great opportunities for large U.S. chemical companies willing to take advantage of small but growing "special situation" product opportunities.

Ferro, for example, is toying with the idea of branching out into mining and refining. In Mexico and other Latin American countries it is eyeing deposits of ores such as feldspar and silica, which are not being exploited. It may mine and refine them, sell what it doesn't use itself.

Vying in Polycarbonate

Mobay Chemical Co. is now striving to be the country's first large-volume manufacturer of polycarbonate resins. Last week, it took the wraps off plans for immediate construction of a plant in New Martinsville, W. Va., which will turn out "commercial quantities" of the new plastic by the spring of 1960.

Mobay officials aren't saying exactly how big the plant will be. They do say, however, it will be comparable to General Electric's polycarbonate unit slated for Mount Vernon, Ind. (*CW, June 6, p. 25*). It's believed that GE's plant is capable of being expanded to about 25 million lbs./year. To start, however, both units will probably have about 10-million-lbs./year capacity.

One attention-getting aspect of Mobay's plans is its proposed early startup — the spring of 1960. This will be approximately three months ahead of GE's target date.

Mobay President J. R. Eck believes the company will be able to get the plant going in that relatively short time because it will use existing plant design know-how developed by Farbenfabriken Bayer, joint owner of Mobay with Monsanto Chemical.

The German firm has been manufacturing polycarbonates commercially for almost a year. A Mobay technical team is now in Europe studying production technology and application markets.

Mobay will ship in bisphenol-A raw material from suppliers, but will produce its own phosgene at recently completed New Martinsville facilities.

According to the company, the new resin material, to be tradenamed Merlon, can be fabricated into end-use products by methods now in common use.

Soviets Miss the Mark

Russia's chemical expansion plans have bogged down. Construction is lagging, much equipment is obsolete, and the industry is unable to absorb the capital investment planned for it. That was the picture painted last week by the head of Russia's chemical industry, V. S. Fyodorov. He informed party chiefs, berated top chemical executives at a five-day meeting of the Communist party's Central Committee.

For the present, chemical output is doing all right, Fyodorov said. During the first five months of this year, output was up 11% over the comparable '58 period, and total '58 production exceeded the previous year's by 13%—4% over the quota.

The trouble lies deeper. Last year, capital investment in the chemical industry fell short of the target by 22%. Plant construction and replacement of equipment was 8% shy of the mark; and 177 out of 230 construction projects failed to meet their planned stages.

The problem, Fyodorov said, lies not in the amount of money allocated, but in the industry's ability to spend it constructively. The construction lag makes it important for the Soviet Union to import whole plants and new processes from the West. He specifically mentioned Britain, West Germany, Sweden, Italy and France.

Slow Motion: Poor distribution is the cause of much of the trouble, Fyodorov asserted. "A number of very important construction projects for synthetic rubber, chemical fibers, synthetic spirits and ammonia in the Bashkir, Altai, Kuibyshev and other regions are having serious difficulties because they are badly supplied with metal — with pipes, stainless steel cables, construction materials," Fyodorov said.

Obsolescence is another headache. He again called for more automation —the major theme of the entire plenary session.

Not only is performance falling behind goals, but the goals themselves are falling short of needs. Fyodorov blasted the planners for underestimating by 40% last year's chemical equipment needs. Also, production schedules are uneven.

The situation, he exclaimed, is "intolerable," because plants specializing in fabrication of chemical equipment spend part of the year "loaded down" with production for which they are not suited.

Research Grumbles: The chemical czar also had some hard words for the research and development organizations. They take too long—often years—to test new processes. Work is duplicated and experiments prolonged beyond their usefulness. "For example, the organic chemistry laboratory at the U.S.S.R. Academy of Sciences is still trying to obtain isoprene from acetone and acetylene, a project that long ago lost its importance."

More jibes came from Z. N. Nuriyev, first party secretary of the Bashkir Autonomous Republic, where big chemical expansion has been planned. He lashed out at lagging construction and "systematic lateness" in reaching decisions on new equipment. Important chemical projects slated to go onstream this year have been idle because they lacked the equipment.

One way the Russians may get around the construction lag is by squeezing more chemicals out of existing plants. According to a recent article in *Tass*, gross chemical output this year will increase by 6 billion rubles ($1.5 billion at the official exchange rate) just by expanding and re-equipping existing plants, saving some $750 million in capital expenditures.

Resin and plastic capacity, it was estimated, can be doubled without building one new plant; and existing plants can boost synthetic fiber capacity 30% to 56,000 metric tons/year, nitrogen fertilizer 20% to 3.3 million metric tons. In the same way, annual production of synthetic rubber can be increased by 100,000 metric tons, caustic soda by 300,000 metric tons; soda ash by 400,000 metric tons, sulfuric acid by 700,000 tons. And tire output can be boosted by 20%—4.5 million units—also in existing plants. Suggestions for these expansions were sent to the central planning organization, GOSPLAN, for approval. How efficiently Russia can capitalize on even the best laid plans, however, is a matter of conjecture.

4-Way Growth Route

Drug specialty maker Baxter Laboratories (Morton Grove, Ill.), riding a wave of drug industry prosperity, detailed booming earnings prospects last week to New York security analysts in a rare public disclosure of its operations. The stepping-stones: more research, plant expansion, new products, and "at least one" acquisition.

President William Graham predicts '59 sales will be up 10% over '58's $25.1 million. After-tax earnings are predicted to rise 20%, though per-share earnings will be in the neighborhood of $2.75, about 10% more than last year. Sales overseas, growing faster than in the U.S., last year hit $3.9 million, or 15% of the firm's total volume.

For the first time, Graham also revealed the size of Baxter's research budget. In '59, he said, R & D outlays will be up 20% to $1.5 million. Last year, Baxter's research investment was just 10% less than after-tax profits, which, said Graham, "may well be the highest such percentage in the industry."

The Baxter chief executive also disclosed that the firm will boost capital expenditures this year to $1.5 million, double the '58 figure. A new plant in Venezuela is planned, and substantial quantities of new equipment will be added at other plants.

In addition, Graham said the company is looking over some possible acquisitions. He predicted that Baxter will acquire at least one company before year-end. Pressed for details in a question-and-answer session following his talk, Graham said the '59 acquisition will "probably not" add significant profits to this year's earnings — though he was optimistic over the longer term.

Boosting near-term prospects are a wide range of products now emerging from research and test stages. Among them: a medical decompressant to reduce intracranial pressure, a plastic blood container, liquid meat tenderizer, an enzyme to aid digestion, tests for gamma globulin and the amount of C-reactive protein in human blood.

Graham hinted that Baxter may eventually apply for stock exchange listing, but he spiked rumors of an imminent stock split.



Argentina's Frondizi: If he falls, U.S. interests may go into a decline.



WIDE WORLD

Brazil's Kubitschek: His drive for dollars may pinch U.S. companies.

Latin Pinch on U.S. Capital

The importance of political affairs abroad for U.S. companies with foreign investments is being painfully pointed up this week by current developments in Brazil and Argentina.

In Brazil — where U.S. capital accounts for something like a third of the $350 million put into the chemical industry during the past five years — harsh threats against foreign investors are resounding across the political stage.

In the Chamber of Deputies, laws have been proposed limiting profit remittances of all foreign companies to 10% of invested capital and imposing other financial restrictions.

And the Socialist Party, gearing up for next year's presidential election, is touting a platform that would prohibit the sending of all profit, royalty, and similar remittances out of the country.

Red-Tinged Threats: The threats, local observers suggest, should not be taken too seriously. At least some of them are probably Communist inspired. But some of the hard words, if not the specific threats, are coming from within the anti-communist administration — even from President Juscelino Kubitschek himself.

In large part they are tactical. Kubitschek knows that the one bright spot in Brazil's economy is the high rate of foreign investment.

But he is trying to pressure the U.S. into granting Brazil desperately needed financial help without insisting on the painful economic stabilization program dictated by the International Monetary Fund: credit and wage curbs, reduced consumer market subsidies, realistic foreign exchange rate.

Remedy Feared Fatal: Kubitschek has made some soft (and unsuccessful) moves to correct the situation. But he believes—rightly, say many observers — that the IMF program would mean still more economic chaos. Furthermore, it would mean political suicide.

To prove his point, Kubitschek can point to Argentina, where President Arturo Frondizi courageously forced through the IMF program. As a result, prices soared, unemployment mounted, and the public reacted with riots and general strikes. Now his cabinet has resigned, and there's a strong possibility of an army takeover.

Still, Frondizi may be able to hold on, Washington feels. But if it grants Kubitschek his aid without the IMF strings attached, it would be pulling the political rug out from under Frondizi, as well as making life hard for the leaders of other South American countries that have forced down the IMF medicine.

The upshot will probably be a compromise, with Washington stretching out Brazil's current exchange bills. But this would not be a permanent solution. And a permanent solution is necessary if Brazil — and the rest of Latin America — is to remain an attractive and safe investment area.

EXPANSION

Paper: St. Regis Paper Co. (New York) has budgeted $2 million for expansion and modernization of its paper mill at Deferiet, N.Y. About $1 million will go for construction of a two-stage wood pulp bleach unit. Other projects: a two-year modernization of the electrical system; improvements of paper machines.

And Crown Zellerbach (San Francisco) is studying feasibility of building a newsprint mill near Denver.

•

Carbon Black: Continental Carbon Co. (New York) will increase capacity of its plant at Lake Charles, La., from 45 million to 70 million lbs./year of high-abrasive carbon black. Cost is estimated at more than $2 million. The contract has been awarded to Fish Engineering Co. (Houston), and the project is expected to be completed by the end of the year.

•

Defluorinated Phosphate: San Francisco Chemical Co. (Montpelier, Idaho)—owned 50-50 by Stauffer Chemical and Mountain Copper Co.—is planning to construct a 6-tons/hour phosphate rock defluorinating unit to produce animal feed supplement-grade material. The new unit will be located at Leefe, Wyo., where the company mines, beneficiates and calcines phosphate rock to supply Western fertilizer producers.

•

Sulfuric Acid, Zinc Sulfide: Matthiessen & Hegeler Zinc Co. (La Salle, Ill.) has set up the Sherbrooke Metallurgical Co. Ltd. to build and operate a zinc sulfide roasting plant and sulfuric acid plant at Port Maitland, Ont. The acid plant—to be constructed by Leonard Construction Co.—will supply sulfuric under a long-term agreement to Electric Reduction Co. of Canada. The latter recently said it will build a phosphate chemicals plant at Port Maitland.

COMPANIES

Century Chemical (New York) has effected a quick-sell financing operation. The recently formed company's initial offering—100,000 common shares—sold out on the day of issue, and demand for the stock jumped almost immediately. One business day later, these shares were changing hands at $5.50—an 83% price rise. Proceeds from this and subsequent offerings will be used to finance several acquisitions already negotiated (*CW Business Newsletter, June 27*).

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Koal Krudes Inc. (Spokane, Wash.) directors are studying alternative methods of financing continued operation of the company's coal-char plant at Red Lodge, Mont. A spokesman explained that Husky Oil did not operate or purchase the plant under an option that expired several months ago. A consulting engineering firm has reported that the plant could be an economic success if the process is improved and the plant is operated on a continuous basis.

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Reichhold Chemicals Inc. (White Plains, N.Y.) will pay 15¢ cash dividends and 2% stock dividends next month.

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Montecatini (Milan, Italy) has completed financing the polyolefins plant it intends to start building later this year at Neal, W. Va. (*CW, June 13, p. 38*). Last week, an underwriting group headed by Lazard Freres, Lehman Brothers, and Kuhn, Loeb sold a $10-million issue of debenture-warrant units. Each unit consists of a $1,000, 5½% sinking-fund debenture and a nondetachable warrant to purchase 103 outstanding shares of Montecatini capital stock.

FOREIGN

Styrene Monomer/Australia: Monsanto is going ahead with plans to build a styrene monomer plant in Australia (*CW, Feb. 14, p. 24*). Its partner will be Petroleum and Chemicals Corp., an affiliate of the oil company Caltex. The plant will be built at Silverwater, near Sidney, is due onstream in '61. Reported cost: $4.5 million. Monsanto's Australian affiliate, Monsanto Chemicals (Australia)—which is not a partner in the new venture—claims to be Australia's largest polystyrene producer.

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Fish Meal, Oil/Poland: Standard Steel (Los Angeles), under an Export-Import Bank credit, is putting up a plant in Poland to convert codfish waste into high-protein meal and oil. The products will be used for fertilizer, paint, tanning and pharmaceuticals.

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Chemicals/Netherlands: Royal Netherlands Salt Industry plans two new acquisitions. It has bid for the shares of Albatros Superphosphate (Utrecht) and of GEMBO (Winschoten). Albatros is the leading Dutch producer of superphosphates, and is building a major sulfuric acid plant with Cyprus Mines Corp.

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Textile Chemicals/Netherlands: Goodyear will build a plant at Tilburg (south Holland) to produce textile resins. Other products may be added later.

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Resins/Venezuela: Reichhold Chemicals is adding another resin plant to its string of foreign operations. The latest is slated for Caracas. RCI will supply the know-how; the plant will be operated by Resinas Venezolanas C.A., formed with local industrialists.

•

Sulfate Pulp/Africa: Courtaulds Ltd. plans to build a $28-million sulfate pulp plant in Swaziland, in partnership with the Colonial Development Corp., a U.K. government agency.

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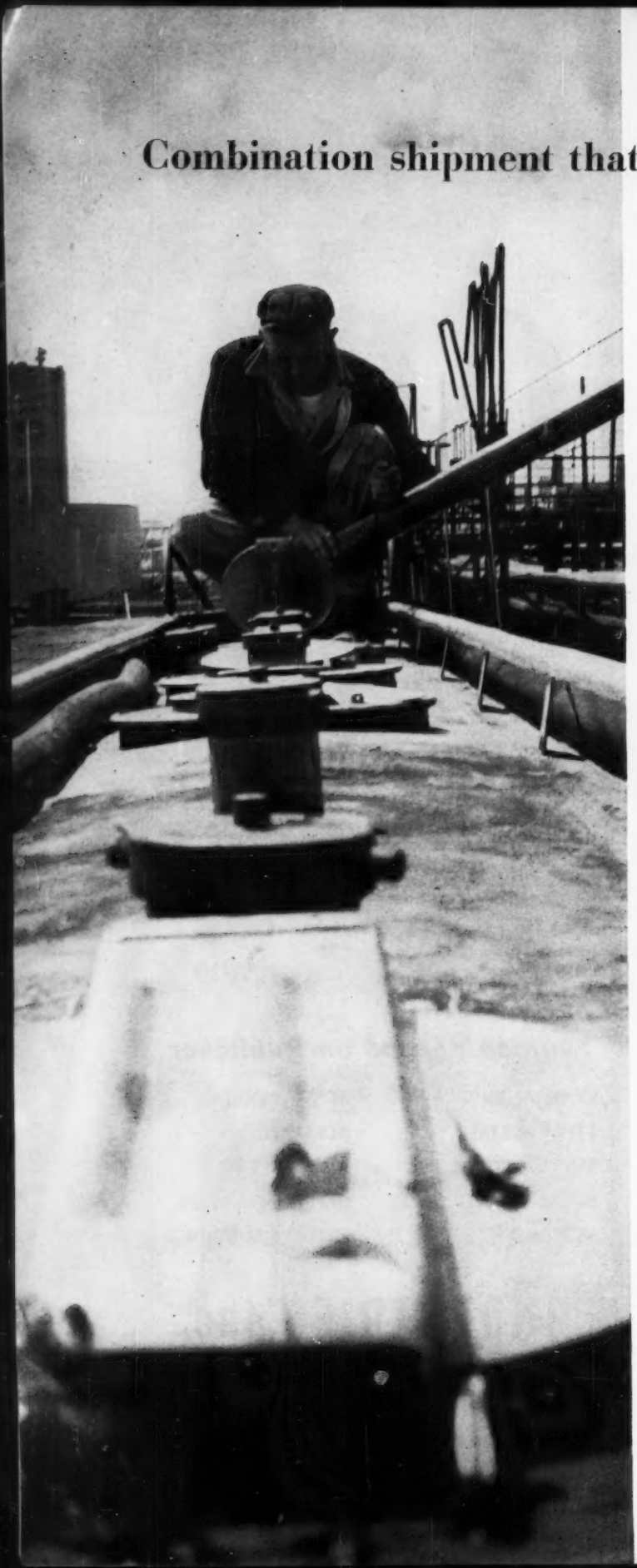
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Washington
Newsletter

CHEMICAL WEEK
July 11, 1959

U.S. foreign aid used "to build socialized industry" abroad is the "height of absurdity." So said John Powers, Jr., vice-president of Chas. Pfizer & Co., Inc., and president of Pfizer International, at a one-day symposium on the government's foreign economic programs in Washington last week.

The conference was sponsored by the new International Economic Policy Assn., an organization of U.S. businessmen, bankers and economists formed to press for a larger role for private industry in overseas aid and investment programs. IEPA is headed by N. R. Danielian, who successfully lobbied for the St. Lawrence Seaway.

The association includes such companies as Standard Oil of New Jersey, Ford Motor Co., and Owens-Corning-Fiberglas.

Powers' criticism was directed particularly at the Development Loan Fund, which he said helps encourage state ownership of manufacturing facilities in the developing nations.

In principle, IEPA supports foreign aid. But the association's aim is to get the government to move faster and farther toward giving private industry more breaks in the program. IEPA backs several Administration proposals—greater tax incentives, new antitrust exemptions, more project development work channeled through private rather than government operations—but wants faster action.

Pfizer recently failed to win a contract for a large pharmaceutical plant in India. The contract went to the Russians.

Aid administrators claim Pfizer asked such complete government guarantees of its profits for the project that DLF administrators could not meet them. They think that is why Pfizer is unhappy with DLF.

Officials fear the net effect of such criticisms of the way the $3-4-billion foreign aid program is administered will be to help those in Congress who want to cut the program sharply.

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Will Russia's fair and Kozlov's visit increase East-West trade? Government officials say "No." They predict that Kozlov will have even less success than Mikoyan did at stirring up talk about potential sales of chemical plants and other items the Soviets want to buy (*also see pp. 25 and 48*).

Strauss' successor at Commerce can hardly be as tough on East-West trade, no matter who he is. But Strauss agrees with the experts who say there will be no easing of existing curbs on trade with the Communist bloc.

Washington Newsletter

(Continued)

Probe of East-West trade policy is in the works on Capitol Hill. Chairman Warren Magnuson (D., Wash.) of the Senate Interstate and Foreign Commerce Committee last week followed up a previously announced study of U.S. export losses, particularly in light of Soviet "dumping," by appointing George Barnes to direct the investigation. Barnes comes to the committee from the Committee for International Economic Growth—Eric Johnston's group—and previously was director of press relations for the United Nations.

•

"The clock is running" for obtaining clearance on food additives, warns Secretary Arthur S. Flemming of the Health, Education & Welfare Dept.

Only 26 of the more than 1,000 additives in use have been submitted for approval. The deadline is not until March '60, but Flemming warns that requests may be submitted near deadline faster than the department can handle them. Possible extension of the deadline, he cautions, will be considered strictly from the viewpoint of consumer protection.

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Dairy waxes are not a health hazard so far as the Food & Drug Administration has been able to determine. This is the official evaluation of somewhat confusing reports recently issued by the National Institutes of Health.

FDA says that, while findings are still being studied, there is at present no basis for action. The one wax found to contain a known carcinogen has been removed from the market. But FDA is supporting further research.

•

Sale of $1.5 million worth of stockpile metals has been proposed by the General Services Administration. That much zirconium, osmium, rhodium and ruthenium has been declared surplus by the Office of Civil & Defense Mobilization. The request has won its first Congressional approval—by a House subcommittee.

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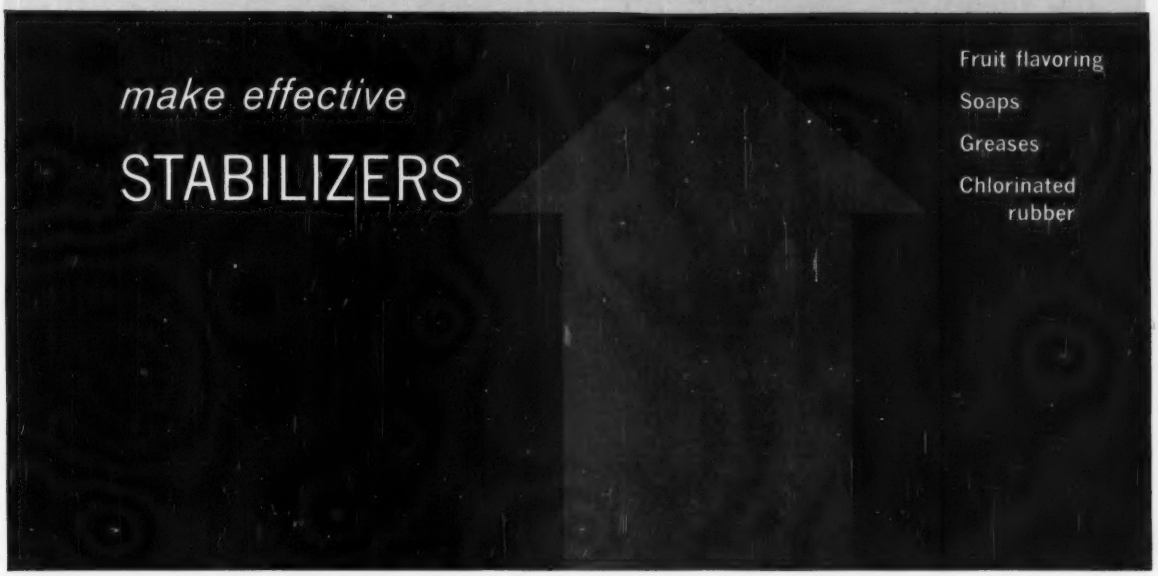
Further tightening of import quotas on lead and zinc ores and concentrates is being considered by government officials—and they're also talking of extending quotas to manufactured products.

Mining bloc senators are putting on the pressure by getting behind a bill to boost tariffs when domestic prices drop to a certain level. Their theory is that this might help force the Administration to move later, particularly in an election year.

•

The Senate bill to hike funds for medical research—raising the Administration's medical research budget from $215 million to $354 million/year—would require 6,000 M.D.s and Ph.D.s, says Secretary Arthur Flemming. But only 2,500 enter the field each year.





From resins and rubbers to foodstuffs and soaps, very small percentages of organotins and inorganic tin compounds have proved their ability to protect products against degradation through exposure to air, heat and light—or from the harmful catalytic effects of impurities or contaminants. The results have been entirely new life-expectancies or new application possibilities for a wide range of products.

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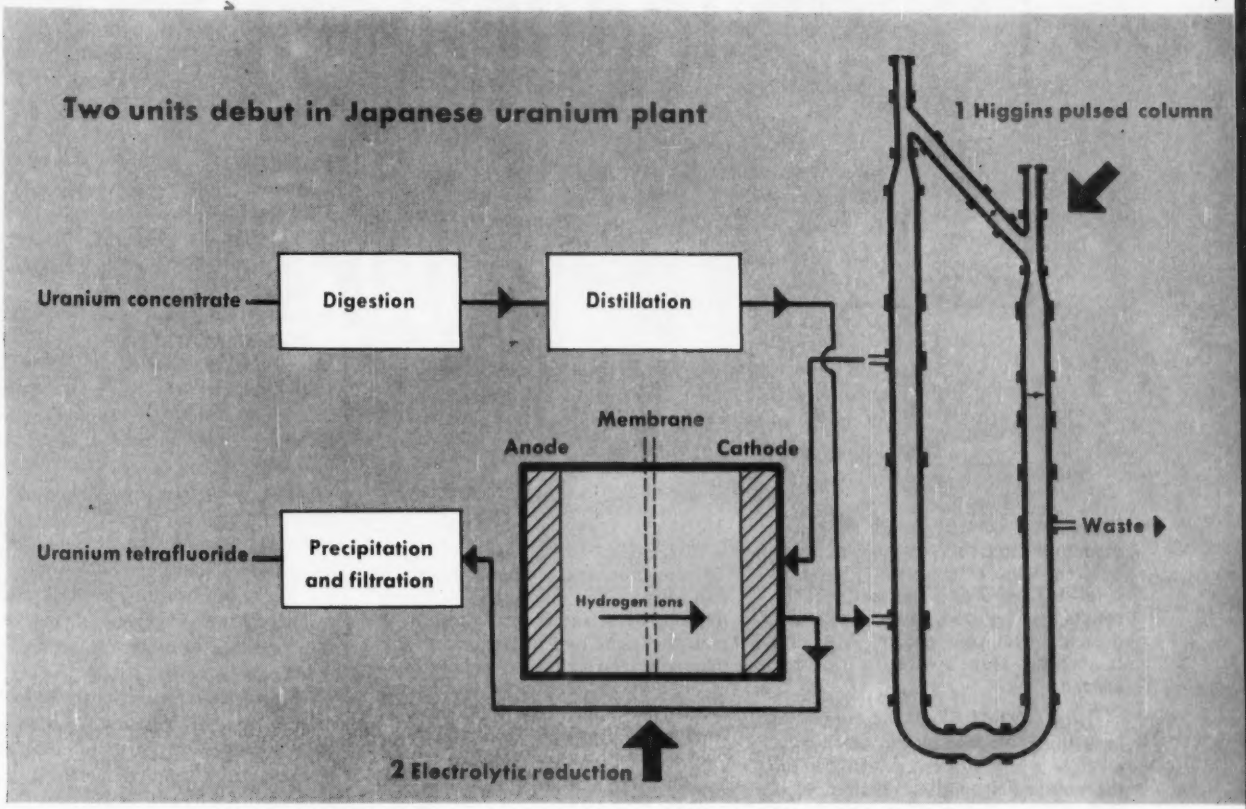
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Process Pair Whittles Uranium Costs

With the recent startup of Japan's first uranium plant by Atomic Fuels Corp. of Tokyo (CW Technology Newsletter, April 11), two novel U.S.-developed processing units made their commercial debut. One is the Higgins semicontinuous pulsed ion-exchange system; the other, an electrolytic reduction cell. Together, they provide a short process that yields high-purity uranium at low capital investment per unit output.

Both of these units had been teamed previously as key components of the Excer process (*CW Technology Newsletter, Oct 20, '56*), developed at Oak Ridge National Laboratory. This commercial version of the process was engineered for the AFC plant by Weinrich & Associates (Washington, D.C.).

Purification Key: The Higgins pulsed ion-exchange unit has several advantageous features to recommend it over alternative fixed-bed or resin-in-pulp ion-exchange processes. One of the most important is its ability to turn out a high-purity uranyl chloride solution that requires very little additional purification. It's this feature —coupled with the electrolytic cell's ability to preserve the purity of the product — that makes it possible to eliminate several steps conventionally used for purification.

Another important advantage of the Higgins ion-exchange system is its compact size. AFC's unit occupies only 15 sq.ft., compared with several hundred square feet that would be required for fixed-bed or RIP units of equivalent capacity. And the inherently higher resin utilization of the semicontinuous ion-exchange system reduces resin inventory needs to as little as 10 to 25% of that required for fixed-bed or RIP batch operations.

Operation is also simplified by the pulsed column's adaptability to automatic control. Valves controlling the flow of feed solution, wash water and hydraulic pulses that move the resin around the circuit are automatically operated, thereby minimizing requirements for operating manpower. The semicontinuous cycle also minimizes dilution of the uranyl chloride stream by limiting elution to only a small portion of the pulsed bed. Here's how the units fit into the over-all processing scheme:

Chloride Route: Feed material to the AFC plant is African yellow cake that's first digested with dilute (5%) hydrochloric acid in two 200-gal. agitated digesters. Sodium chlorite is added to assure complete dissolution of uranium in the hexavalent form. Uranyl chloride from the digesters is concentrated in a distillation column (which removes much of the excess water), then fed to the Higgins column.

Feed liquor flows in near the bottom

PLASTIC PIPE AD WITH NO PICTURE?

Why no picture: Because almost all plastic pipe looks the same. You know yourself that looks can be mighty deceiving, and piping that goes wrong can be mighty expensive. A picture means nothing... but...

There are scores of brands of plastic pipe on the market... made of a dozen different kinds of materials. Most of it is labeled "corrosion-resistant" but the results may be good, bad or indifferent depending on your choice. A picture is no help. Here's what to look for instead:

The universal material? No such thing. No one plastic can handle all liquids and gases... no one has *all* the physical properties required of a truly universal pipe. Closest to it are Ace Riviclor (Rigid PVC) and Ace-Ite (rubber-plastic blend). The former is a little better on chemical resistance, the latter is a little better on impact strength and heat resistance. Both same price.

Are plastics strong enough? Thousands of chemical plants say "yes". Pipe is now available in several wall thicknesses... in flexible tube sizes (Ace-Flex clear transparent), up through gas-tubing sizes (Ace-Ite and Ace Riviclor), through flexible Supplex polyethylene pipe, and Schedules 40 and 80 rigid plastic pipe for pressures up to 490 psi.

Above that, there's Ace rubber-lined steel pipe. And don't forget Ace soft-rubber-lined pipe for resistance to abrasion.

Where do I use it? For corrosive chemicals and gases of all types. The only ones that are difficult are certain solvents and chlorinated aromatic hydrocarbons, and if you're careful to pick the right *one* of the *many* Ace materials, you can even handle most of these tough corrosives. Use plastics, too, for water lines, gas lines, electrical conduit, etc., or any lines where the pipe passes through corrosive vapors or damp areas, or goes underground.

Is there a plastic for hot corrosives? Yes, Ace Tempron, which is good to 275 deg. F. with most chemicals. Stays chemical resistant, strong, and rigid where other plastics may be attacked or may sag.

How can I dodge "trial and error"? Go to a company that has no axe to grind. We, for instance, make no less than nine different kinds of pipe ... with fittings and valves to match... and give you thoroughly unbiased advice backed by 100 years of experience and prices as low as you'll find anywhere.

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of one leg of the U-shaped ion-exchange unit, passes downward through the resin in the bottom of the loop. A wash solution of hydrochloric acid is fed in slightly above the pregnant liquor inlet, flows downward with the feed stream. After passing through the resin, the mixture of impurity-bearing acid and barren liquor are taken off near the bottom of the other leg of the column and passed to a distillation column for recovery of the hydrochloric acid.

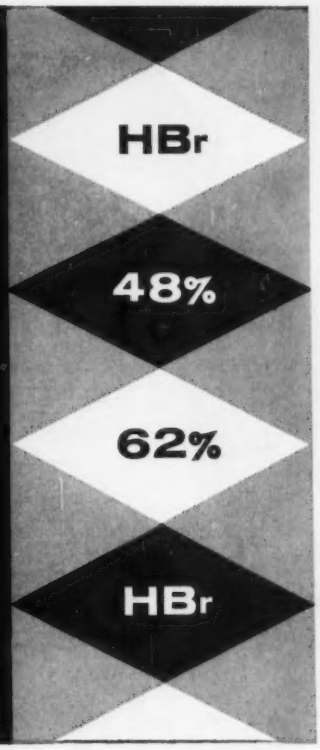
At the end of a two- to three-minute solution-pumping cycle, the flow is interrupted for five to ten seconds while the column is hydraulically pulsed to push the resin 3-4 in. around the circuit, counter to the flow of feed solution. This movement brings loaded resin up from the absorbing zone to a washing zone, where the purified uranyl chloride is eluted with water. At the same time, a portion of regenerated resin from the top of the washing zone is transferred to the other leg of the unit for recycling through the absorption zone.

Electrolytic Reduction: Purified uranyl chloride solution, containing 50-100 grams/liter of uranium, is fed directly to the cathode chambers of a bank of 12 diaphragm cells. Sulfuric acid is electrolyzed in the anode chambers to provide hydrogen ions, which pass through the membranes, and oxygen, which passes off as gas. The divalent uranyl ion (UO_2^{++}) decomposes at the cathode, yielding oxygen, which combines with the hydrogen ions to form water. The resulting tetravalent uranium ions combine with chlorine, pass out of the cell as uranium tetrachloride.

The tetrachloride is next treated with aqueous hydrofluoric acid to precipitate the uranium as the tetrafluoride (green salt). After filtration, drying and dehydration at 830 F, the green salt is converted into uranium metal by conventional magnesium reduction. A final vacuum remelting operation provides additional purification of the metal.

International Cooperation: Though the Excer process had to go abroad to make its commercial debut, several U.S. firms had a hand in the planning and preparation leading up to its successful start. The vital ion-exchange purification system was built and tested by Illinois Water Treatment Co. of

Hydrobromic Acid



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Check these useful reactions: Hydrobromic acid is a strong acid which reacts readily with most inorganic bases to produce inorganic bromides such as lithium, sodium, potassium and ammonium bromide, useful in photographic processes.

It reacts with many aliphatic alcohols in the presence of dehydrating agents to produce aliphatic bromides. Aliphatic bromides, which are generally more reactive than the corresponding chlorides, are useful in the preparation of Grignard reagents and other organometallic bromides, quaternary ammonium salts and as alkylating agents.

Hydrobromic acid can be used to cleave ethers to produce aliphatic alcohol and bromide. It will also react with epoxides to produce vicinal bromohydrins with two reactive centers, thus, permitting many additional reactive possibilities.

Ask for our help: Michigan Chemical produces 48% Technical Grade Hydrobromic Acid and is the sole producer of 62% Technical Grade Hydrobromic Acid in commercial quantities. Our wide experience in bromine and bromine derivatives is immediately available to you through our Technical Service Group. Our plants in Saint Louis, Michigan and El Dorado, Arkansas provide dependable sources for high purity bromine chemicals in constant supply—up to tank car quantities, if desired. Write us about your area of interest or for technical data and prices.

Analysis:	48% Technical
Molecular Weight:	80.924
Specific Gravity at 20/4° C:	1.488
Pounds a gallon at 20° C:	12.4
HCl, not more than:	0.10%
Vapor Pressure at 30° C:	——
Vapor Pressure at 50° C:	——

Analysis:	62% Technical
Molecular Weight:	80.924
Specific Gravity at 20/4° C:	1.74
Pounds a gallon at 20° C:	14.5
HCl, not more than:	0.15%
Vapor Pressure at 30° C:	85 mm
Vapor Pressure at 50° C:	380 mm

For complete listing of Michigan Chemical products, see your copy of Chemical Materials Catalog or Chemical Week Buyers Guide.

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Rockford, Ill., exclusive licensee of Chemical Separations Corp. (Oak Ridge, Tenn.). Ionics, Inc. (Cambridge, Mass.), which had worked closely with ORNL on the development of the Excer process, supplied the electrolytic reduction equipment; NRC Equipment Co. (Newton Highlands, Mass.) made the vacuum remelting equipment employed for final metal purification. Construction of the plant was handled by Chiyoda Chemical Engineering & Construction Co., Ltd. under subcontracts from prime contractor Asano Bussan Co. of Tokyo.

Despite reports of impurity problems in AFC's initial batch of uranium metal (*CW Technology Newsletter, May 9*), the plant is now operating smoothly. Weinrich & Associates' William Nixon, who represented the engineering firm at the startup of the Japanese plant, reports that high-purity uranium slugs have been made from AFC's green salt and that the vacuum recast metal should have even higher purity.

Molecular Sieves' Jobs

To bolster molecular sieves' bid for greater use in the petroleum industry, Linde Co., a division of Union Carbide Corp., is pushing a new technical-aid program. Chief objective: acquainting all major petroleum processors with molecular sieves' ability to compete with more conventional processes of splitting hard-to-separate petroleum products.

Principal target: the potentially large market that's opening up as a result of the continuing trend to higher-octane motor fuels. All major petroleum processors are looking at molecular sieves for this use, says Linde; most have development programs under way. To aid these potential customers, Linde is now offering three large volumes of technical data, summarizing what the company has learned about the physical properties and operating characteristics of molecular sieves.

Start from Scratch: One of the major problems of moving into a new field, Linde points out, is the lack of technical information in the literature. To fill this gap, the company has spent more than six years compiling data at its Tonawanda, N.Y., laboratory, on such vital design factors as isotherms, heat transfer in packed-bed systems and multicomponent adsorption correlations. In addition, it has designed (and operated in bench-scale equipment) an octane-improving process that demonstrates the economic advantages of a molecular sieve separation technique over conventional fractionation methods.

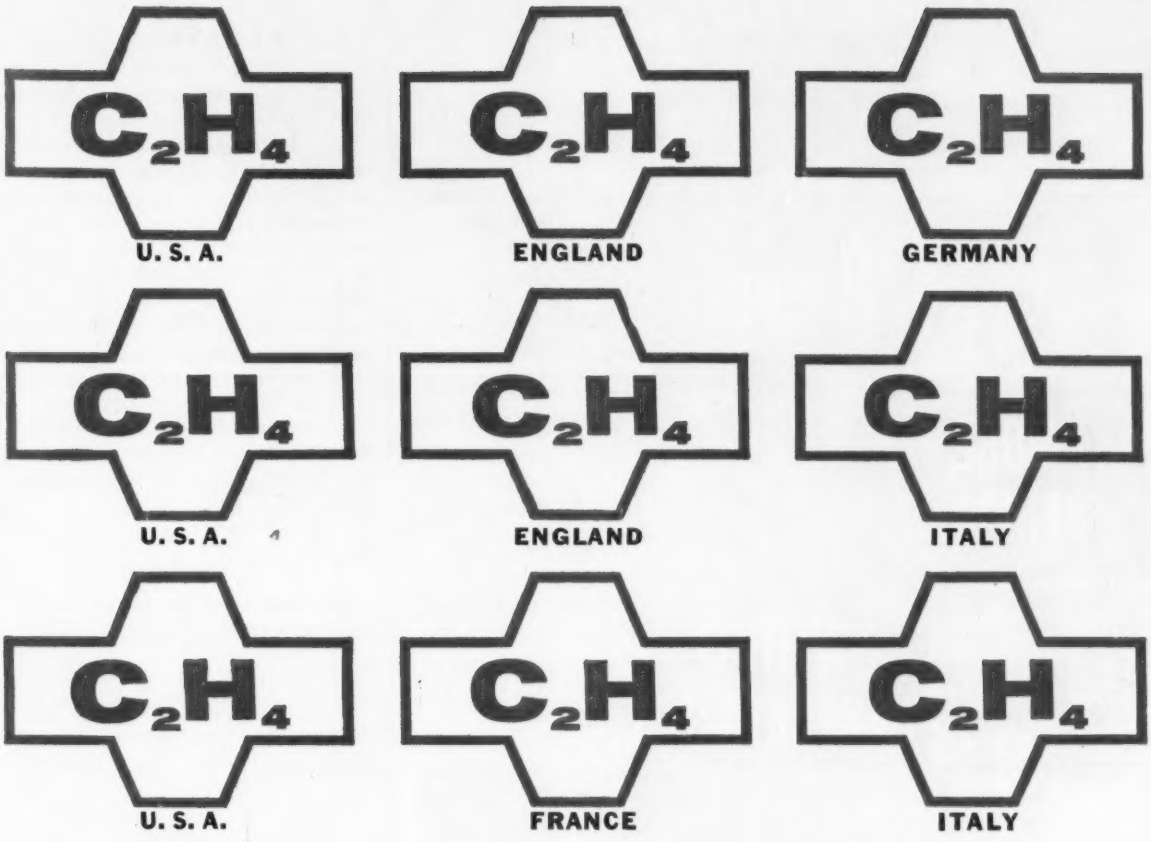
Linde emphasizes that it's not interested in selling a process — only in boosting molecular sieves. Its octane improvement technique was developed primarily to test new operating methods and to provide a basis for economic evaluation of over-all operating costs. The bench-scale setup served these purposes, says Linde, but the process would probably require pilot-plant testing before it could be scaled up to full commercial size.

Operating Technique: One of the most difficult operating problems that had to be solved, says Linde, was how to make a fixed-bed process competitive with continuous processes. In general, fixed beds are less economic than moving beds. But molecular sieves are susceptible to attrition damage, must be handled in fixed beds that operate cyclically.

Linde solved this problem by devising a rapid-cycle system in which one fixed-bed of sieves adsorbs for five minutes while a second bed is being desorbed. To provide uninterrupted operation, a third bed is kept on stand-by to permit periodic burn-off of carbonaceous material that accumulates on the adsorbent.

Regeneration of the molecular sieves (removal of the adsorbed material) sets the scene, says Linde, can be accomplished by thermal swings, by pressure swings or by purge-gas stripping. For its typical octane improvement process, Linde selected a vacuum desorption step by which adsorbed straight-chain hydrocarbons would be removed at reduced pressure.

One of the big advantages of teaming molecular sieves with an isomerization unit, says Linde, is that the low-octane, straight-chain components can be isomerized virtually to extinction. With fractionation, on the other hand, a prohibitively large number of plates would be required to separate all of the unreacted straight-chain components for recycle to the isomerization unit. Yield of isomer product, according to Linde's estimates, runs



A BILLION-POUND BACKGROUND in Engineering Ethylene Plants

Leading oil and chemical companies on both sides of the Atlantic testify to the Kellogg Organization's ability to engineer ethylene manufacturing and recovery plants. The twelve for which Kellogg has been responsible to date represent an annual capacity in excess of 1,050,000,000 pounds!

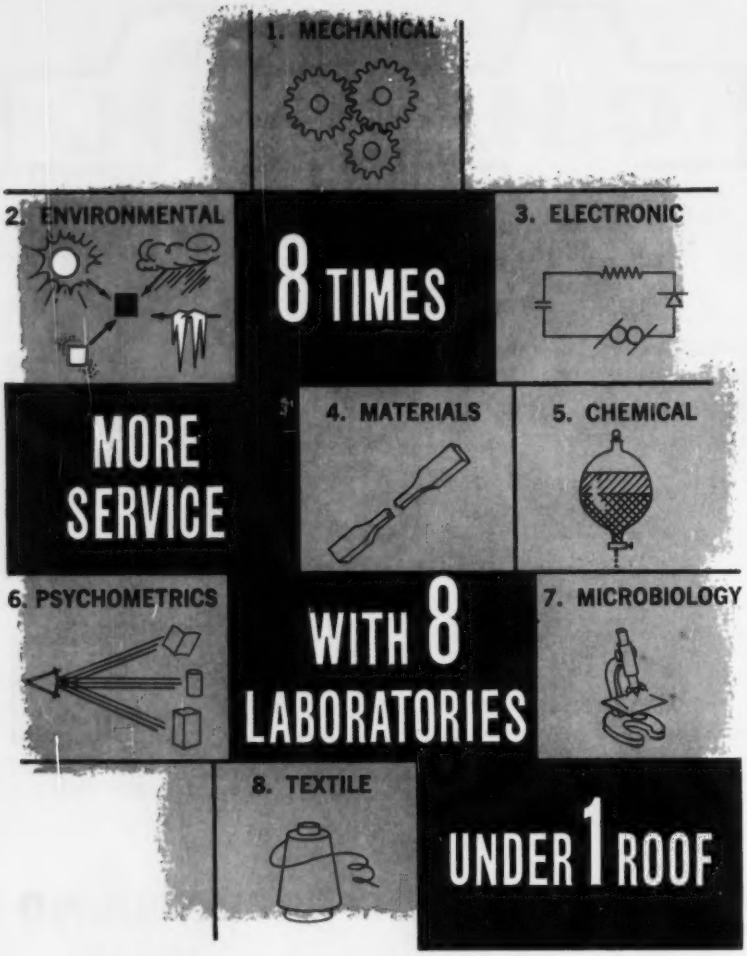
Utilizing its high-efficiency steam-pyrolysis process, and many unique design features, Kellogg is unusually equipped to engineer and build economically sound plants for producing high purity ethylene and other valuable olefins from various feed-stocks.

Typical Kellogg design innovations for ethylene recovery systems are: (1) a heat pump circuit which permits tower top reflux to be provided by condensing overhead vapors while doing tower reboiler duty; (2) an auto-refrigeration system based on a Joule-Thompson or Isentropic expansion of tower overhead vapors; and (3) an intermediate condenser and reboiler on the demethanizer to minimize refrigeration requirements.

When considering ethylene plants, call on the billion-pound background of The M.W. Kellogg Company.

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99.5% by molecular sieve separation, 97.6% by fractionation.

Volume Business: Linde's interest in the potential market offered by octane improvement processes is understandable in view of the quantities of molecular sieves that would be required. For example, the 4,000-bbls./day plant used for estimating purposes would require 70,000 lbs. of adsorbent in each of the three fixed beds. Replacement frequency under full-scale operating conditions hasn't been determined, but the company feels that present estimates of a two-year service life for the material is a "conservative minimum."

PROCESSES

Gas Cleanup: Tidewater Oil Co. is planning a multimillion-dollar cycling and desulfurization plant to process 50 million cu.ft./day of natural gas from the New Hope Smackover Field in northeast Texas. It's designed to recover such salable components as propane and butane, in addition will produce an estimated 224 long tons/-day of sulfur from hydrogen sulfide.

•

Plutonium Cycle: Construction work on the plutonium-recycle test reactor at AEC's Hanford Works is now in the final phase; the $15-million reactor is scheduled for completion next spring. A $4-million pilot plant for fuel fabrication will be completed by September. The facility will be used to develop fuel processing techniques by which plutonium can be recycled to replace uranium-235 conventionally used for enrichment.

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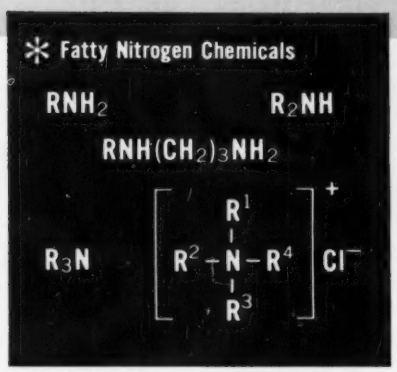
Esparto Pulping: Societe Nationale Tunisienne de Cellulose is building an $11-million pulp mill at Kasserine, Tunisia, to produce 80 metric tons/-day of bleached esparto pulp. The plant will electrolyze sea water to yield caustic soda for pulping, chlorine for bleaching.

•

Phthalic Route: Japan's Yawata Chemical Co. will build a 3,600-tons/-year phthalic anhydride plant employing the catalytic air-oxidation of naphthalene. The process was developed by Chemische Fabrik von Heuden AG. (Munich, Germany), features a unique liquid separation of the product in place of the conventional sublimation in air-cooled chambers.

General Mills announces...

24 NEW Fatty Nitrogen* Chemicals...



Above left, fatty primary amine; *above right,* fatty secondary amine; *center,* fatty diamine; *lower left,* fatty tertiary amine; *lower right,* fatty quaternary ammonium chlorides.

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New Fatty Quaternary Ammonium Chlorides (Aliquats)

Product	Description	Quaternary Ammonium Compound	% Sodium Chloride	pH
Aliquat 5	myristyl trimethyl ammonium chloride	48-52	1 max	9 max.
Aliquat 7	stearyl trimethyl ammonium chloride	48-52	1 max.	9 max.
Aliquat 11	oleyl trimethyl ammonium chloride	48-52	1 max.	9 max.
Aliquat 15	oleyl-linoleyl trimethyl ammonium chloride	48-52	1 max.	9 max.
Difatty Dimethyl Ammonium Chlorides				
Aliquat 204	dilauryl dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Aliquat 205	dimyristyl dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Aliquat 206	dipalmityl dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Aliquat 207	distearyl dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Aliquat 215	di (oleyl-linoleyl) dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Trifatty Methyl Ammonium Chlorides				
Aliquat 336	tricaprylyl monomethyl ammonium chloride	73-77	0.5 max.	5-7
Quaternized Fatty Diamines				
Aliquat 721	Quaternized coco diamine	48-52	1.0 max.	9 max.
Aliquat 726	Quaternized tallow diamine	48-52	1.0 max.	9 max.

New Primary, Secondary and Tertiary Fatty Amines (Alamines)

Product	Description	Amine Value	Iodine Value	% Primary Amine
Primary Fatty Amines				
Alamine 5	primary myristyl amine	244-264	3 max.	87 min.
Alamine 5D	distilled primary myristyl amine	255-265	3 max.	97 min.
Alamine 15	primary oleyl-linoleyl amine	190-200	90 min.	87 min.
Alamine 15D	distilled primary oleyl-linoleyl amine	200-210	90 min.	97 min.
Secondary Fatty Amines				% Secondary Amine
Alamine 204	secondary lauryl amine	153-167	3 max.	85 min.
Alamine 205	secondary myristyl amine	132-143	4 max.	85 min.
Alamine 206	secondary palmityl amine	116-126	5 max.	85 min.
Alamine 207	secondary stearyl amine	100-110	5 max.	85 min.
Alamine 215	secondary oleyl-linoleyl amine	105-115	90 min.	85 min.
Tertiary Fatty Amines				% Tertiary Amine
Alamine 304	trilauryl amine	98-116	3 max.	90 min.
Alamine 321	tricoco amine	91-107	5 max.	90 min.
Alamine 336	tricaprylyl amine	132-142		90 min.

WRITE, WIRE OR PHONE if you would like more information about Fatty Nitrogen Chemicals. Tell us your intended application or the areas you'd like to explore and we can help you more.

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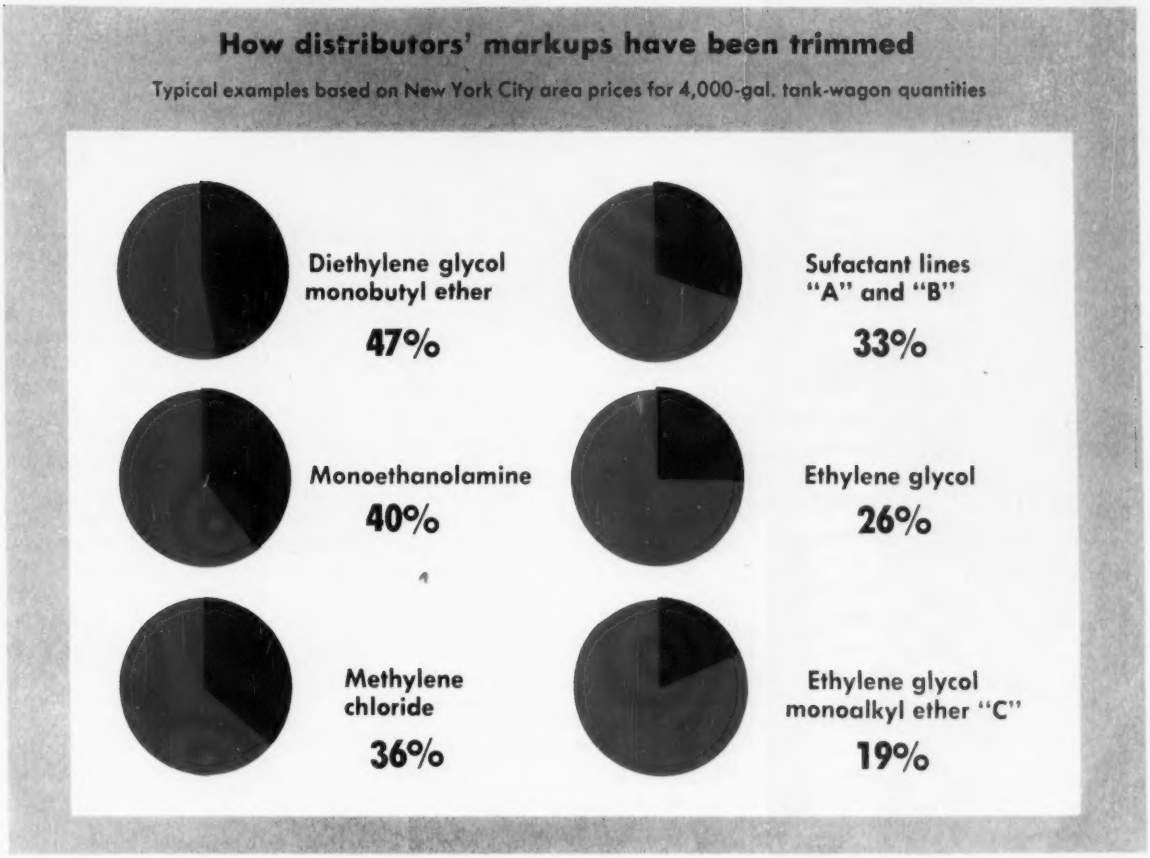
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New Margin Slashes Stir Distributors' Ire

Slashes of 19-47% in distributor profit margins on a wide range of petrochemicals sold in bulk and semi-bulk by jobbers are shaking the chemical-distributor field this week. Distributor laments vary from the relatively mild "rather disturbing" to predictions of the end of all chemical distributors.

The reductions result from a new resale pricing system initiated by major producers that places distributor margins on a straight cents/pound basis. Under the old system, the margin was a flat, percentage discount on the tank-car price.

Chemicals affected by the move include glycols, glycol ethers, ethanolamines, some surfactants, methylene chloride and polyglycols. In the New York City area, for example, the dealer markup for ethylene glycol resold in 4,000-gal. tank-wagon or compartment-truck quantities has been cut from 0.00675¢/lb. to 0.0050¢/lb.

Simultaneous with the change in the resale pricing system, price differentials between less-carload-lot (LCL) and carload (CL) quantities of drummed material have been increased ½¢/lb. This will increase the profit per drum for many of the chemical lines involved in the change. Example: the profit margin on a drum of one popular glycol will increase from $11.63 to $14.03. In a few cases, profit per drum will fall.

Taking an over-all view, chemical distributors believe the system will have at least five general effects:

(1) Distributors that sell bulk quantities directly from their own warehouse stocks or from their supplier's stocks will suffer a sharp cut in profits on the volumes involved.

(2) Distributors that purchase in bulk, then repackage, will gain a tidy margin increase with the advance in LCL/CL differentials.

(3) Distributors reselling drum quantities packed by the manufacturer will now suffer a slight increase in costs of ½ to 1%, although the total profit per drum will often be larger.

(4) Cuts in margins will make it unattractive for distributors to warehouse higher-priced items. The higher LCL price ties up a greater amount of capital in inventories of high-priced items. Dealers may have less incentive to stock low-priced bulk items.

(5) Activity of marginal operators —often responsible for unethical distributor pricing practices—will be sharply curtailed.

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3, 5 Dimethyl Pyridine
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3, 5 Dibutyl Pyridine.

Some of these new compounds are being used in extraordinary and profitable ways. While SECURITY (ah, this atomic age!) prevents us from disclosing the exact *who* and *how* of these uses, we would like to tell you what we know about the performance characteristics of the nitrogen heterocyclics. If you have more than a casual interest in these specialized chemicals, we suggest your investigation begin by writing for our latest technical bulletins . . . and for sample quantities. If your development is somewhat further along, we're available for consultation.

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den and somewhat unexpected shift? Petrochemical producers say that reassessment of distribution costs in recent months indicates that costs of handling distributor accounts and L-CL shipments have been underestimated. Labor, freight, handling, and other factors, they add, have been rising. Upshot: distributor margins allegedly were "out of line."

Besides that, however, say informed trade sources, the slash in margins is doubtless an effort to lower the boom on the marginal distributor, an undesirable minority in the field. Often lacking in the facilities and services that economically justify the role of a wholesaler, the marginal operator has survived mainly by unscrupulous price-cutting. (Such operators, for example, often split commissions with customers.)

Moreover, some producers are now recognizing frequent distributor complaints that too many distributors or agents have been appointed to supply the same industrial areas (*CW, July 4, p. 63*). This "overconcentration" tends to promote the pricing chaos. Margin dealing in some areas, reports a West Coast jobber, has reached the point where distributors have taken control of prices away from manufacturers. Cutting margins, he claims, is a move to "regain control."

The margin reductions are also quite likely an attempt to make bulk and semibulk distribution less attractive to jobbers. In recent years, wholesalers have dealt increasingly in tank-wagon and compartment-wagon (500, 1,000, 1,500 gal.) quantities. A Pittsburgh dealer tells *CW*: "It's the best way to boost sales and profits." A *CW* survey (*Aug. 23, '58, p. 75*) indicated that in '57 an average of 51% of agents' and brokers' revenue came from bulk sales; for distributors, the average was 23%.

Most manufacturers believe that the chemical distributor has little place in bulk business, either because he cannot provide the technical service and development research on new products that the large customer is entitled to or because he must rely on his supplier for the service and research. In the latter case, the manufacturer must provide it out of a profit reduced by the dealer's commission. Some suppliers, however, endorse jobber sale of small semibulk quantities. Here, the effect of the margin cuts is much less pronounced.

Distributor Reaction: The paring of margins is stirring a storm of distributor reaction. Smaller jobbers emphatically claim the move will wipe out both bulk and LCL distributors. Even under the old system, they add, margins were not large enough to yield adequate profits. [Average net profits as a percent of sales in '57 were 3.2% for large wholesalers, about 8% for small distributors (*CW, July 26, '58, p. 75*).]

Moreover, they feel that recent moves to eliminate freight equalization payments on chlorinated solvents, sodium phosphates and alkalis in cases where the customer uses his own trucks to pick up materials at plantside is a step aimed at eliminating jobbers.

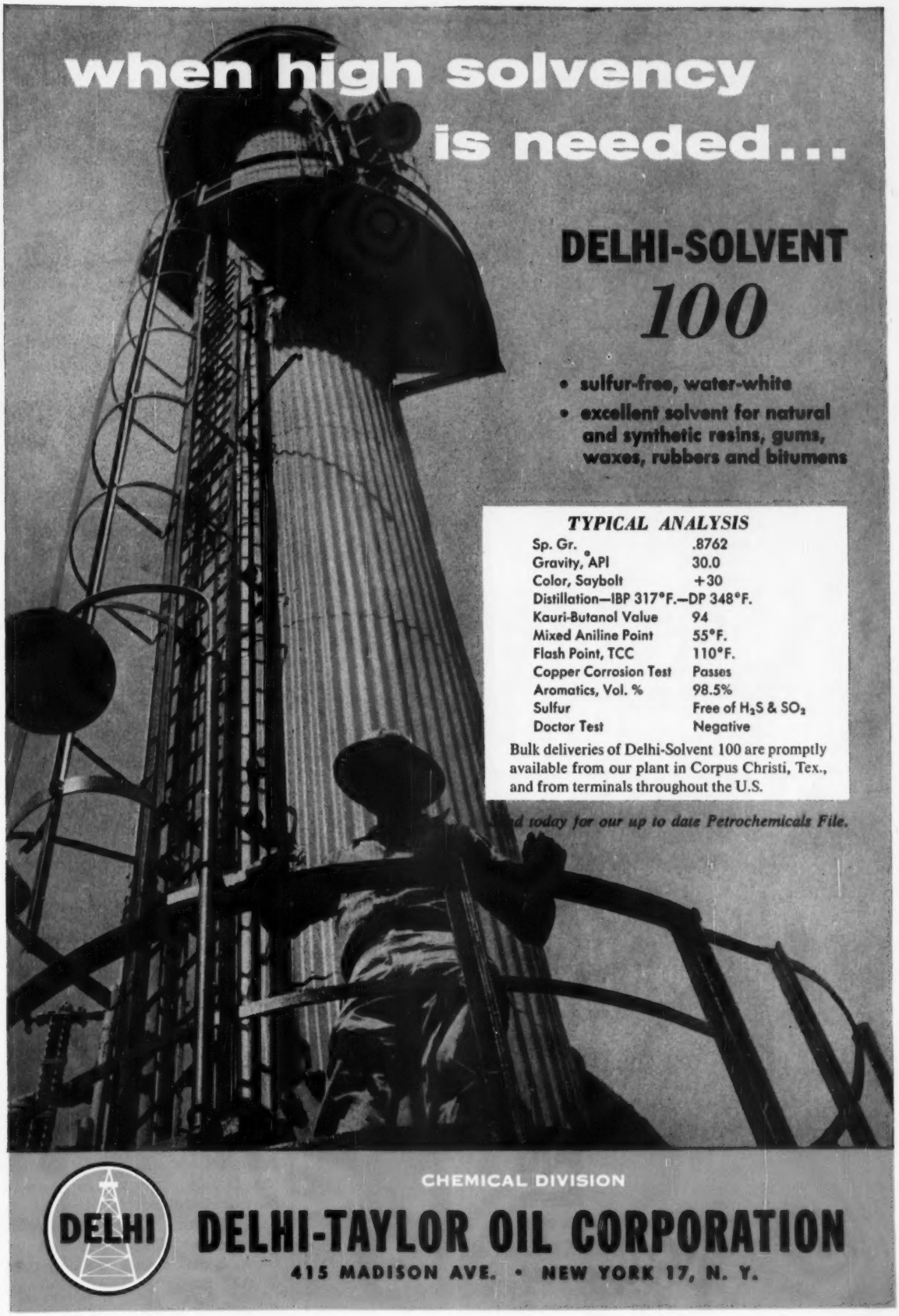
Distributors—large or small—cannot escape the effects of lowered margins by simply raising prices. Reason: most producers sell materials in the same quantities at the posted price. Customers would, of course, seek the cheapest source of supply.

Changes in resale margins and freight equalization allowances are spurring talk of forming a national chemical distributors' trade association. Some Eastern jobbers are at least hopeful of establishing a "united front" to present their case.

Larger chemical distributors view the situation with less alarm. To them the developments are "very serious," "a step in the wrong direction," "plain stupid." These companies do not believe that producers have any intention of jettisoning jobbers entirely.

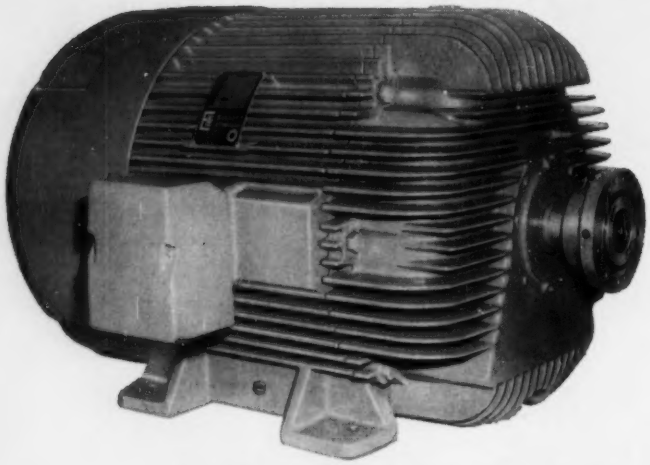
And larger wholesalers say they see "prospects of market stability," are hopeful that "marginal price-cutters will be shaken out." And they hail cessation of freight allowances on plantside pickups as a means of curbing "gypsy" reselling—resellers picking up chemical shipments at distant plants to maximize the freight allowance, and then vending the materials at cut-rate prices.

But large distributors are quick to stress the deleterious effect margin reductions will have on their profits—especially profits arising from sales in bulk. The reductions are criticized because "they hurt all distributors—the ethical and the unethical alike." It's unfair, they add, to "crack down


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WB-5

on ethical distributors for the faults of the chiselers." Ideally, they would prefer to see suppliers merely thin distributor ranks by terminating relations with "backyard blenders."

Moreover, some take a cautious view of the benefits that the boost in LCL prices will have. Some indicate to *CW* that the hikes will merely make it easier for producers to compete with jobbers in LCL markets and give the price cutter more room to deal in. And profit gains from the boost in differentials will be realized only if competition doesn't make it impractical.

Set to Last? Distributor opinion splits sharply on whether the margin reductions will stick. Some believe that concerted pressure or holdouts in supplier ranks may force a reconsideration. Others say that, if the economic climate remains healthy, thus moderating the competitive scramble, the change in resale margins is here to stay.

As the impact of the resale margin changes sinks home this week, distributors have begun to worry about future moves. There's a distinct fear that the idea will spread to other chemicals—especially organic items selling for over 8-10¢/lb., in which range producers can absorb high local freight costs. Others fear that the "fixed margin" will mean that future price advances will not be matched by corresponding boosts in dealer margins. This would, in effect, tend to reduce distributor return on investment.

Vigorously reacting to the revolutionary situation, distributors are already protesting to their suppliers. Others are eyeing imports. And a few may drop the lines affected in favor of more profitable chemicals. More jobbers may seek consignment terms for slow-moving high-priced items.

Despite panic in some quarters, there's little evidence this week that a general exodus from chemical distributor markets is under way. And, there's even less indication that producers are planning to drop distributors. In fact, some producers plan to increase distributor participation in LCL markets.

Consensus: although the fields of emphasis may change, the operations of the efficient chemical distributor will remain profitable.

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CW PHOTO—MARSHALL

Giant molecular models decorate Soviet exhibit in New York as . . .

Russians Stage Road Show

Soviet showmen last week opened their Exhibition of Science, Technology and Culture in the New York Coliseum.

The huge fair, with over 10,000 items displayed on the first three floors of the spacious Coliseum, gives the Russians their biggest chance to make their pitch in the U.S. Key attractions:

- Models of Soviet Sputniks.
- Scale model of the atomic-powered icebreaker *Lenin.*
- A propaganda-loaded Atoms-for-Peace display.

Soviet chemical process technology got its play, too, but not on the same scale as the atomic and electronic displays. An elaborate model of a butadiene synthesis plant underscores Russian claims of a novel synthetic rubber process. Other models include replicas of steel mills and coal mines. A large panel tells how the Russians use nephelites (sodium aluminum silicates)—almost unknown to U.S. processors—to produce aluminum and by-products—e.g., portland cement, potash, and the rare metal, gallium. Samples of sheets, tubes, bellows and other plastic articles are displayed.

U.S. at Moscow: Meanwhile, *CW* correspondents in Moscow report workmen are whipping the American exhibition in Sokolniki Park into readiness for the July 25 opening.

About 4 million persons are expected to view the American exhibit, in which the CPI will have a leading role. Outstanding contribution: three all-plastic pavilions consisting of 90 umbrella-shaped, interlocked sections of fiber-glass-reinforced polyesters.

The pavilions were built at a cost of $160,000, which was shared by 42 firms of the CPI. Besides the financial support of the project, many CPI firms supplied materials or work for the pavilions. Examples: the fire-resistant polyesters came from Hooker; the fiber glass was supplied by Owens-Corning and Ferro Chemical; and the parasol-shaped sections were fabricated by Lunn Laminates.

Added attraction: the gold-anodized aluminum dome designed and fabricated by Kaiser Aluminum & Chemical Sales Co.

Other CPI exhibits at Moscow will portray American progress in nuclear research, use of the newest pharmaceuticals and fertilizers, modern synthetic fibers and household plastic items, and many other objects.

organic chemicals

FROM ROHM & HAAS COMPANY

ACRYLIC MONOMERS

Acrylic Esters

Acrylates $CH_2=CHCOOR$

Methacrylates $CH_2=C(CH_3)COOR$

Polymers derived from this series of acrylic and methacrylic esters vary from soft, rubber-like, film-forming materials to hard, transparent plastics. These esters may be polymerized by bulk, suspension, solvent, and emulsion techniques. They copolymerize readily with a large number of other monomers and can contribute to the resulting copolymers: internal plasticization, better heat and light stability, improved compatibility with other resins, better adhesion properties, greater toughness, stability of emulsions, and solubility in alkalies. *Typical uses:* thermoplastic sheets and molding powders, solvent coatings, adhesives, latex paints, heat-resistant elastomers, binders for explosives, water-soluble thickeners, and emulsions for textile, leather, and paper finishing. Commercially available.

- Methyl Acrylate
- Ethyl Acrylate
- Butyl Acrylate
- 2-Ethylhexyl Acrylate
- Methyl Methacrylate
- Ethyl Methacrylate
- Butyl Methacrylate
- Hexyl Methacrylate
- Decyl-Octyl Methacrylate
- Lauryl Methacrylate
- Stearyl Methacrylate

Acrylic Acids

Glacial acrylic acid and glacial methacrylic acid are water soluble monomers which can be polymerized to water-soluble polymers.

$CH_2=CHCOOH$
Glacial Acrylic Acid

$CH_2=C(CH_3)-COOH$
Glacial Methacrylic Acid

They may also be copolymerized with other monomers to obtain polymers having varying degrees of solubility in alkali or water. *Typical uses:* In copolymers, small quantities of these acids can: 1) provide a product which can be vulcanized with metallic oxides without the use of sulfur, or can be cross-linked with diepoxides, diamines, glycols, etc., 2) improve freeze-thaw and mechanical stability of emulsions, 3) improve adhesion properties, 4) increase resistance to attack by oils, 5) provide an alkali- or ammonia-solubilizing group. Amphoteric copolymers may be produced by copolymerization with basic monomers such as dimethylaminoethyl methacrylate. These acids also serve as intermediates for the production of special esters such as glycol diacrylates and dimethacrylates. Commercially available.

Other Monomers

$CH_2=C(CH_3)-CONH_2$
Methacrylamide

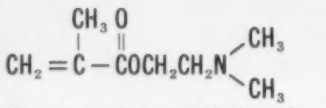
Methacrylamide is a water-soluble monomer which can be polymerized to a water-soluble polyamide, or copolymerized with other monomers to give a reactive group for cross-linking purposes.

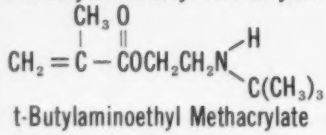
Dimethylaminoethyl Methacrylate (DMAEM) and *t-Butylaminoethyl Methacrylate* (*t*-BAEM) provide means for introducing amino groups into copolymers. Both copolymerize with vinyl-type

continued

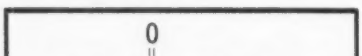
organic chemicals FROM

Other Monomers (continued)


Dimethylaminoethyl Methacrylate

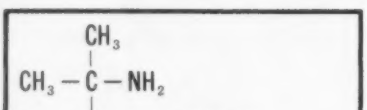

t-Butylaminoethyl Methacrylate

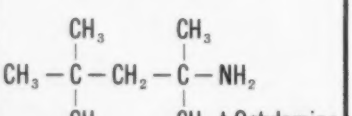
monomers. DMAEM is a water-soluble monomer; it can be polymerized to a water-soluble cationic polymer, or copolymerized with an acidic monomer such as methacrylic acid to give a polyampholyte. *t*-BAEM undergoes typical reactions of the amine group via the active hydrogen. DMAEM and *t*-BAEM are suggested as intermediates for preparing anchoring agents for dyes, pigments, waxes, and moistureproofing compounds . . . dispersing agents for non-aqueous systems . . . antistatic agents . . . ion exchange resins . . . emulsifying agents . . . and cationic precipitating agents. Other Rohm & Haas acrylic monomers include methoxyethyl acrylate, calcium acrylate, lauryl acrylate, decyl-octyl acrylate, and sodium methacrylate. Availability of monomers mentioned in this paragraph: sodium methacrylate—commercial; all others—pilot plant.

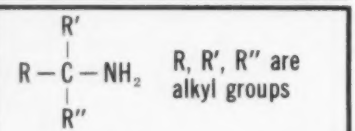

Methoxyethyl Acrylate

Calcium Acrylate
Lauryl Acrylate
Decyl-Octyl Acrylate
Sodium Methacrylate

t-ALKYL AMINES

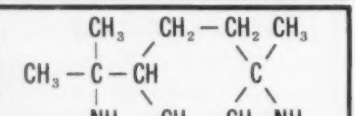

t-Butylamine


t-Octylamine


R, R′, R″ are alkyl groups

t-Nonylamine: 9-10 Carbons
PRIMENE 81-R: 12-14 Carbons

PRIMENE JM-T: 18-21 Carbons


Menthane Diamine

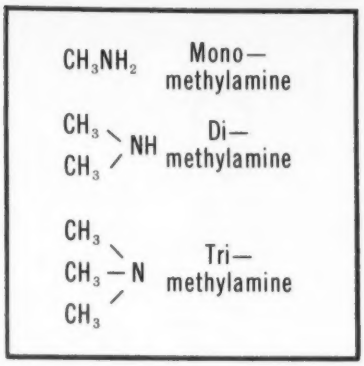
t-Buty'amine, t-Octylamine, t-Nonylamine, PRIMENE 81-R, and PRIMENE JM-T have a number of unusual properties not found in straight-chain primary amines of corresponding molecular weight range. Some are: fluid character and low viscosity over a wide temperature range, color stability, resistance to oxidation, and excellent oil solubility. Although these amines undergo most of the reactions common to their straight-chain counterparts, the attachment of the amino group to a tertiary carbon imparts unusual reactivity to t-alkyl amines in several reactions—e.g. formation of principally secondary amines in amino-hydrogen substitution reactions, and formation of stable aldimines ($R-NH=CHR'$), carbodiimides ($R-N=C=N-R$), and t-alkyl-cyanamides ($R-NH-CN$). The last three derivatives of normal primary amines are relatively unstable. *Typical uses:* Intermediates for bactericides, surface-active agents, rubber chemicals, anti-foaming agents, flotation agents, antistatic agents, fungicides, pharmaceuticals, antioxidants, dyestuffs, photographic chemicals, and insecticides. PRIMENE 81-R and PRIMENE JM-T are particularly useful as oil additives. Commercially available.

•

Menthane Diamine, a low viscosity liquid, is a primary alicyclic diamine. Like the other t-alkyl amines, it has its amino groups attached to tertiary carbons and thus exhibits "steric-controlled" reactivity which permits amino-hydrogen substitution reactions to form secondary amines, but inhibits tertiary amine formation. *Suggested uses:* curing agent for epoxy resins, and intermediate for preparing menthane diisocyanate, polyamides, and other organic chemicals. Commercially available.

ROHM & HAAS COMPANY

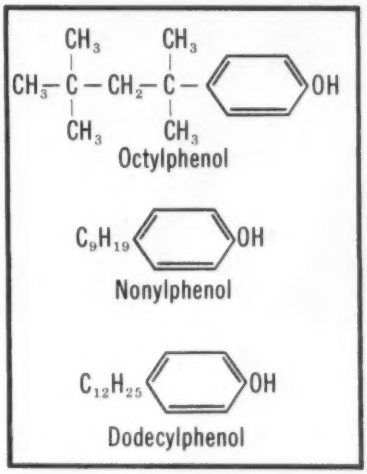
METHYLAMINES



Mono-, di-, and trimethylamine are very low-cost sources of amino nitrogen. They are worth investigating as intermediates in the preparation of agricultural fungicides, accelerators for rubber vulcanization, unsymmetrical dimethylhydrazine (for rocket propellants), surface-active agents, p-methylaminophenol (for photographic developers), 1,3-dimethylurea (an intermediate in the synthesis of theophylline and caffeine), analgesics not related to or derived from morphine, dimethylaminoethanol (an intermediate for local anesthetics and antihistamines), sympathomimetic drugs (e.g. N-methylphenethylamine or N-methylphenylpropylamine derivatives), choline chloride (poultry-feed additive), high-molecular-weight quaternaries, acid-gas absorbents, and explosives. Commercially available in aqueous and anhydrous forms.

ALKYLPHENOLS

Octylphenol is a flaked solid; nonylphenol and dodecylphenol —liquids. They undergo the normal reactions of the phenolic hydroxy group and nuclear substitution of the benzene ring. Reactions include etherification, condensation with aldehydes, esterification, sulfonation, halogenation, and nitration. Etherification of alkylphenols with ethylene oxide produces a variety of surface-active agents. Lubricating- and fuel-oil additives and vinyl stabilizers are obtained from calcium and barium salts of alkylphenol derivatives. Phenolic resins with improved oil-solubility, water resistance, and electrical resistance are produced by condensing formaldehyde with phenol and a small quantity of an alkylphenol. Octylphenol stabilizes ethyl cellulose against ultraviolet light degradation. Alkylphenols also offer possibilities in preparing fungicides, bactericides, dyestuffs, pharmaceuticals, adhesives, and rubber chemicals. Commercially available.



DYTOL Fatty Alcohols

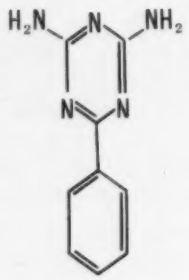
The DYTOL fatty alcohols have the general formula $CH_3(CH_2)_nOH$. Compositions are given in the table below. These fatty alcohols undergo many typical alcohol reactions. They may be ethoxylated, sulfated, esterified, halogenated, and dehydrated. They may be oxidized to aldehydes and carboxylic acids. *Typical uses:* Antifoaming and emulsifying agents. As chemical intermediates, DYTOL fatty alcohols are useful in making cosmetic-cream additives, polymerization regulators for rubber and plastics, textile finishing and softening agents, emulsifiers, lubricating-oil detergents, and quaternary ammonium compounds. Commercially available.

	DYTOL M-83 (OCTYL)	DYTOL A-24 (LAURYL)	DYTOL B-35 (LAURYL)	DYTOL J-68 (LAURYL)	DYTOL L-79 (LAURYL)	DYTOL E-46 (CETYL-STEARYL)	DYTOL F-11 (CETYL)
% Octyl (C_8)	98.0	none	none	none	none	none	none
% Decyl (C_{10})	2.0	1.5	1.5	1.0	none	none	none
% Lauryl (C_{12})	none	71.0	60.0	82.0	98.0	none	none
% Myristyl (C_{14})	none	27.0	25.0	17.0	2.0	1.2	1.0
% Cetyl (C_{16})	none	0.5	13.0	none	none	34.0	97.0
% Stearyl (C_{18})	none	none	0.5	none	none	64.8	2.0

organic chemicals FROM ROHM & HAAS

OTHER ORGANIC CHEMICALS

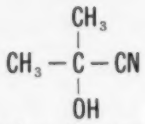
Available in Commercial Quantities



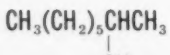
Benzoguanamine

$HOCH_2CH_2CN$

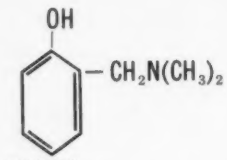
Ethylene Cyanohydrin



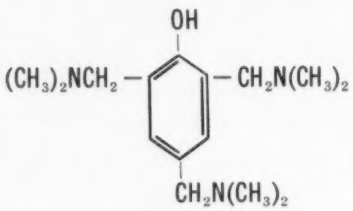
Acetone Cyanohydrin



Solvent C-8
(85% capryl alcohol)

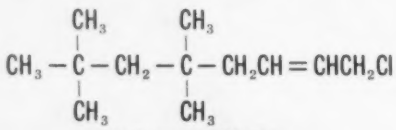


DMP-10
(Dimethylaminomethylphenol)

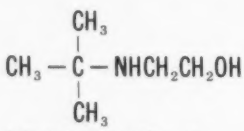


DMP-30
[2,4,6-Tri(dimethylaminomethyl) phenol]

Available in Pilot Plant Quantities



Dodecenyl Chloride



t-Butylaminoethanol

$R-NH-(CH_2)_{11}CH_3$

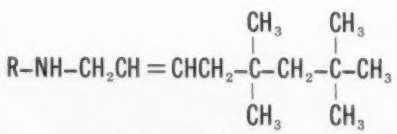
Amine RJ-2046
R = mixture of isomers having 12-14 carbons, with tertiary-alkyl structure.

$(CH_3)_2NCH_2CH_2N(CH_3)_2$

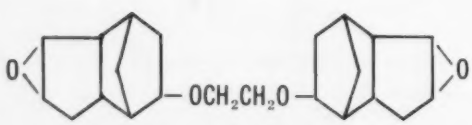
Tetramethylethylene Diamine

$N\equiv C-CH_2CH_2COOCH_3$

Methyl Cyanopropionate



Amine 9D-178
R = mixture of isomers having 12-14 carbons, with tertiary-alkyl structure.



Diepoxide AG-13E
(Bis-Epoxydicyclopentyl Ether of Ethylene Glycol

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Chemicals for Industry

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The Lady Leases Equipment

Chemical process equipment buyers may be hearing more of a new pitch that includes an option to lease. The idea was expounded last week by persuasive Chicago businesswoman Josephine Leider (right), Midwest regional sales director of Nationwide Leasing Co. (Chicago), at a luncheon meeting of the Chemical Equipment Sales Engineers Assn. of Chicago (CESEAC). Her audience was interested, but somewhat skeptical.

Mrs. Leider is trying to spur equipment company adoption of the leasing plans her firm will tailor to chemical industry needs. But the attitude of equipment salesmen seems to mirror that of their customers. While Mrs. Leider points out that drug and chemical equipment leasing has increased nearly 10-fold since '55 and more than doubled from '57 to '58, last year's total of more than $18 million *(CW Technology Newsletter, Jan. 10)* was small, compared with the all-industry total of $300 million.

Naturally, Mrs. Leider believes that many chemical equipment buyers could use a leasing arrangement to advantage. She feels they have been hesitant to do so because of unfamiliarity with leasing companies and their services. To help overcome this unfamiliarity, Nationwide has developed the new approach Mrs. Leider outlined to CESEAC.

Same Old Ties: The original and most-used leasing plans call for the equipment user to approach the leasing company, work out specifications for the needed equipment and the details of the leasing contract. The leasing company, after a check of the company's financial rating, purchases the equipment—usually from the equipment firm preferred by the user.

Instead, Nationwide suggests that equipment vendors use leasing as a selling tool. The relationship between equipment buyer and seller would then remain as it always has been. But the buyer would get from the vendor the alternatives of buying or leasing. If leased, the leasing com-

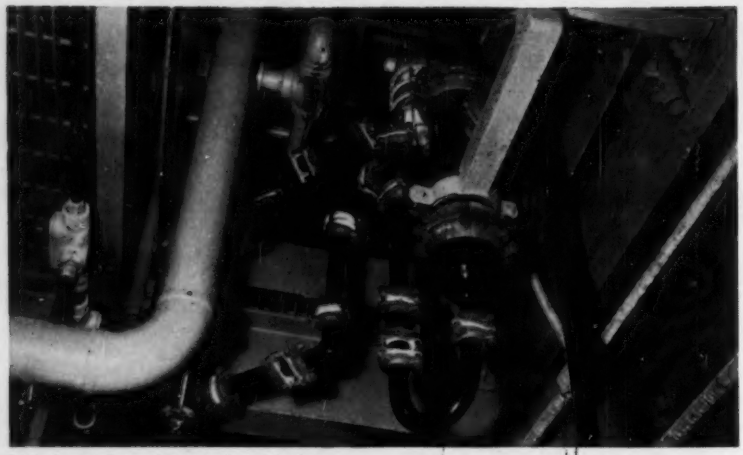


Josephine Leider states case to CESEAC equipment sales group.

CW PHOTOS—SID HARRIS

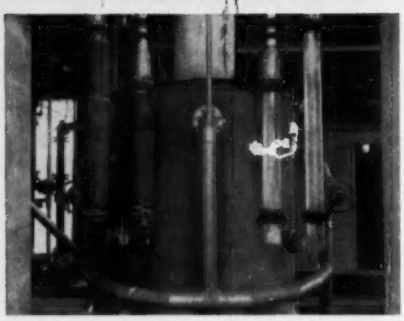


Equipment sales engineers listen with interest, and some skepticism, to Nationwide's leasing plan.



1. No danger of corrosion or product contamination, even with highly reactive processes, when you use PYREX Pipe. That's why you'll find PYREX Pipe handling pure bromine in Michigan Chemical's plant at El Dorado, Arkansas.





2. You can use PYREX Pipe outdoors, too, even where ambient temperatures differ widely from those of fluids handled. 3. You can keep constant visual check on flow because PYREX Pipe is transparent. This lets you see blockage, or other problems, before extensive damage is done.

A lot of bromine means a lot of glass

Michigan Chemical depends upon PYREX® Pipe to safeguard its bromine output

You would hardly attempt to make bromine in the laboratory in anything but glass—and probably glass bearing the PYREX trademark.

Naturally enough, when Michigan Chemical Corporation built its new El Dorado, Arkansas, plant, in cooperation with the Murphy Corporation, a lot of PYREX Pipe footage was installed.

Much of the glass pipe is used to deliver bromine from the Kubierschky extraction towers. The rest is used to handle hot acidified brine and ethylene bromide.

If you have ever had anything to do with the manufacture of bromine —or with any such corrosive process— you know what Mr. Clayton Carter, Plant Manager, means when he says, "PYREX Pipe is one of the few materials we have found that will withstand the extreme corrosion."

Not only is PYREX Pipe easy to keep in service—even under these rugged conditions—it is easy to *put* in service.

Your Own Men Can Install PYREX Pipe

PYREX Pipe is no more difficult to install than any other piping. For one thing, it's lighter, easier to handle, takes fewer hangers. There are no expansion joints, no lead pouring. All that is needed is a wrench and a good strong right arm. It doesn't have to be babied.

And PYREX Pipe Costs Less

PYREX Pipe is rugged. It's chemically inert. It withstands extremes of thermal shock. Add these up and you have the reasons a PYREX Pipe installation costs so little—*just because it lasts so long.*

Get the Facts

The best way to get the facts about what PYREX Pipe can do for you is to try it out yourself in your plant. Just ask us about making a test installation.

For all the facts on application, design, and installation, send for a free copy of Bulletin PE-3. Just write to Corning Glass Works, 2 Crystal Street, Corning, New York.

CORNING GLASS WORKS

CORNING MEANS RESEARCH IN GLASS

pany would pay for the equipment. The leasing company would then be merely a collection agency (and, of course, owner of the equipment). The buyer's main contact would still be with the vendor, who maintains his usual warranties and service.

For the vendor, whose main interest is cash on the barrelhead, the leasing company removes the annoyance of operating its own collection agency, since the vendor is paid by the leasing company. The buyer (in this case, the lessee) pays the leasing company's fees in addition to the full purchase price of the equipment over the period of the leasing contract. This adds to the user's actual equipment cost and, of course, the user never owns the equipment. But Mrs. Leider maintains that leasing is "one of the most sensible and profitable" ways a CPI company can use capital equipment. Her reasons:

- Leasing permits a firm to keep its working capital at the job of earning money, rather than having it tied up in equipment. In the CPI, she says, average before-tax profit rate on net working capital is around 45%; in drugs, about 60%; in pulp and paper, 50%. "This means that a company must expect to lose about 50¢ in before-tax profits out of every dollar it takes away from working capital," she maintains.
- Leasing offers important tax advantages. It permits speedier write-offs than are possible on many items under present government depreciation schedules. She compares leases of 3-10 years to depreciation periods of 5-10 years. And lease payments are considered operating expenses to be paid out of income before taxes, while outright purchases essentially come out of profits after taxes.
- Leasing offers a means of long-term financing without forcing the firm to dilute its ownership through securities issues or adding partners.
- Leasing also aids short-term financing by reducing the need for borrowing, keeping the firm's credit lines open.
- Leasing also provides a hedge against inflation, since payments are made over a period of years. Future dollars will be worth less than current dollars unless there is a reversal of the inflationary spiral.

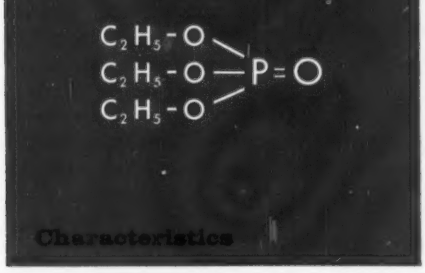
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- **a starting material for insecticide manufacture**
- **a useful catalyst for:**
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Acidity, as H_3PO_4	**0.03% max.**
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Flash Point	**240°F.**
Weight per Gallon, 20°C	**8.90 lbs.**

Eastman triethyl phosphate is soluble in water and most organic solvents. It is very resistant to hydrolysis at ordinary temperatures.

It is quite useful as an ethylating agent, for all three of its ethyl groups are available.

Triethyl phosphate reacts with phosphorus pentoxide or oxytrichloride to yield polyesters which have unusual properties as insecticides. These complex esters also show some promise as rodenticides.

We'll be glad to send you detailed information and samples of Eastman triethyl phosphate for your evaluation. Write to EASTMAN CHEMICAL PRODUCTS, INC., Chemicals Division, KINGSPORT, TENNESSEE.

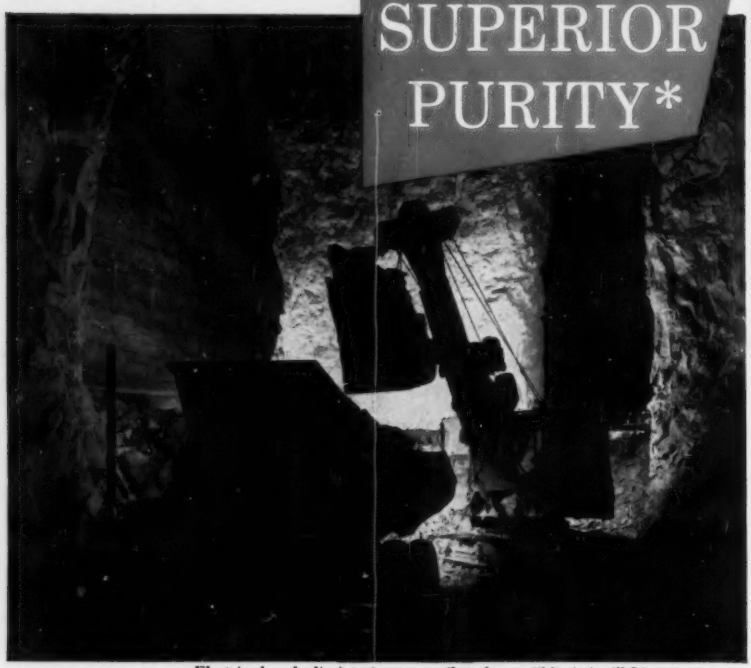
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KINGSPORT, TENNESSEE, subsidiary of EASTMAN KODAK COMPANY

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Framingham, Mass.; Greensboro, N. C.; Houston; New York City; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

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lessee pays about 5% of the equipment's original cost in fees each year. Fees for leasing beyond the original lease period are considerably lower than those for the original lease period. And, Nationwide is gambling that most companies will want to release. It, like other leasing companies (e.g., U.S. Leasing Corp. and Boothe Leasing Corp., both of San Francisco) stresses that it isn't out to compete with equipment vendors. As one leasing company points out, it is in the money business, not the equipment business.

No Waiting: A vendor with a lease-option will be able to come into an equipment buyer's office with a pocketful of new sales points. One of the biggest: the buyer no longer must "wait until budget time" to decide on the acquisition of a new piece of equipment. Instead of a large lump-sum, the basis of discussion becomes a more convenient monthly payment.

Talking in terms of monthly expenses makes it easier to compare cost of the new equipment with costs of running the present units.

Another point on efficiency: at the end of a lease, the equipment can be replaced with more modern units. Hence, the company gets the latest equipment, avoids obsolescence (assuming it chooses the right term for its lease) without having to make periodic large outlays.

And the convenience of being able to arrange for leasing through regular equipment manufacturers' salesmen is not to be ignored.

Some Reservations: As yet, none of the equipment vendors queried by *CW* has instituted this type of plan.

One calls it a "specialized tool." Another says, "I think this idea is especially applicable to what I call the 'little buyer.'" A third points out that five-year depreciation of some chemical equipment lines is not unusual. And an outright buyer would retain the equipment after fully depreciating it, would probably get several more years of service.

Another vendor believes that the most likely types of equipment for extensive leasing are dust collectors, waste disposal and pollution-abatement equipment, saying, "There are always those pieces of nonproductive equipment that a company must have but doesn't like paying for."

Some equipment manufacturers



Louisville Dryer—10 feet in diameter, 10 stories long!

Turn a ten story building on its side, and there'd be room to spare on either end of this huge pit lathe at Sharon, Pennsylvania where this 10′ x 110′ Louisville Dryer was fabricated.

This lathe is used for machining the reinforcing bands onto which are mounted the forged steel tires. This careful workmanship assures concentricity of the completed dryer shell—a primary factor in efficient seal operation.

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Terpene oxides
Silicones
Perfume intermediates
Product-rich residues

Rochester Division CEC

CONSOLIDATED ELECTRODYNAMICS/rochester 3, new york

also feel that their line may be too small a part of the buyer's total installation to warrant leasing. Declares one, "My sale might represent less than 10% of the total equipment cost of a firm. Why should he lease it and buy everything else outright? It would be like my buying a car and leasing the carburetor."

Another question raised is the advisability of conserving working capital on equipment purchases, which usually constitute the main object for which working capital is needed. One sales engineer thinks it would be more logical to start by renting office equipment, for instance, to conserve working capital for outright equipment purchases.

Other points to be considered: lease payments might become a cash drain in times of drooping profits; and rented equipment can't be used as collateral for loans.

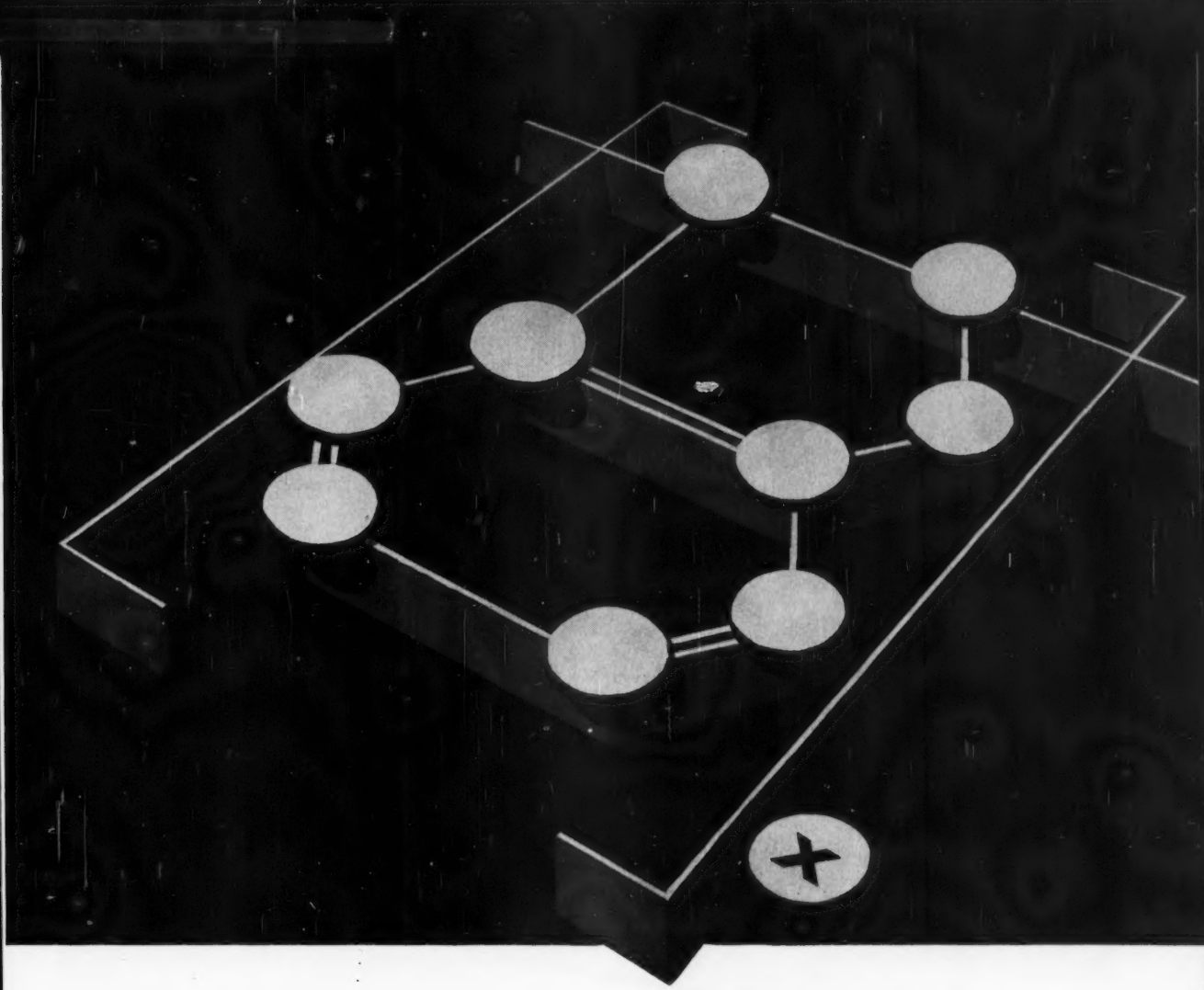
Granting these and other questions yet to be fully answered, it's certain that equipment leasing is on the upswing in the CPI. And it's likely that equipment buyers will be hearing more about this idea from visiting sales representatives.

EQUIPMENT

Oxygen Analyzer: The Hays Corp. (Michigan City, Ind.) is out with a new analyzer for measuring low concentrations of oxygen. The analyzer is recommended for oxygen measurement of inert gas atmospheres and high-hydrocarbon mixtures. The device is called Model 632, is offered in three detection ranges: 0-1%, 0-2% and 0-3%. The unit is not affected by hydrogen concentrations up to 50% and is said to be sensitive to oxygen changes as low as 0.01%. Accuracy: ±2% of range.

•

Fine Grinders: Sturtevant Mill Co. (Dorchester, Mass.) has two new units for fine grinding. One, called the Pulver-Mill, is a vertical hammer mill with an integral air classifier for extremely fine grinding of soft, nonmetallic materials. Capacities up to 5,000 lbs./hour are offered. The other development is a line of Micronizer fluid-energy mills lined with tungsten carbide. Abrasive materials with hardnesses up to that of tungsten carbide can be pulverized down to "several" micron size, says the company.



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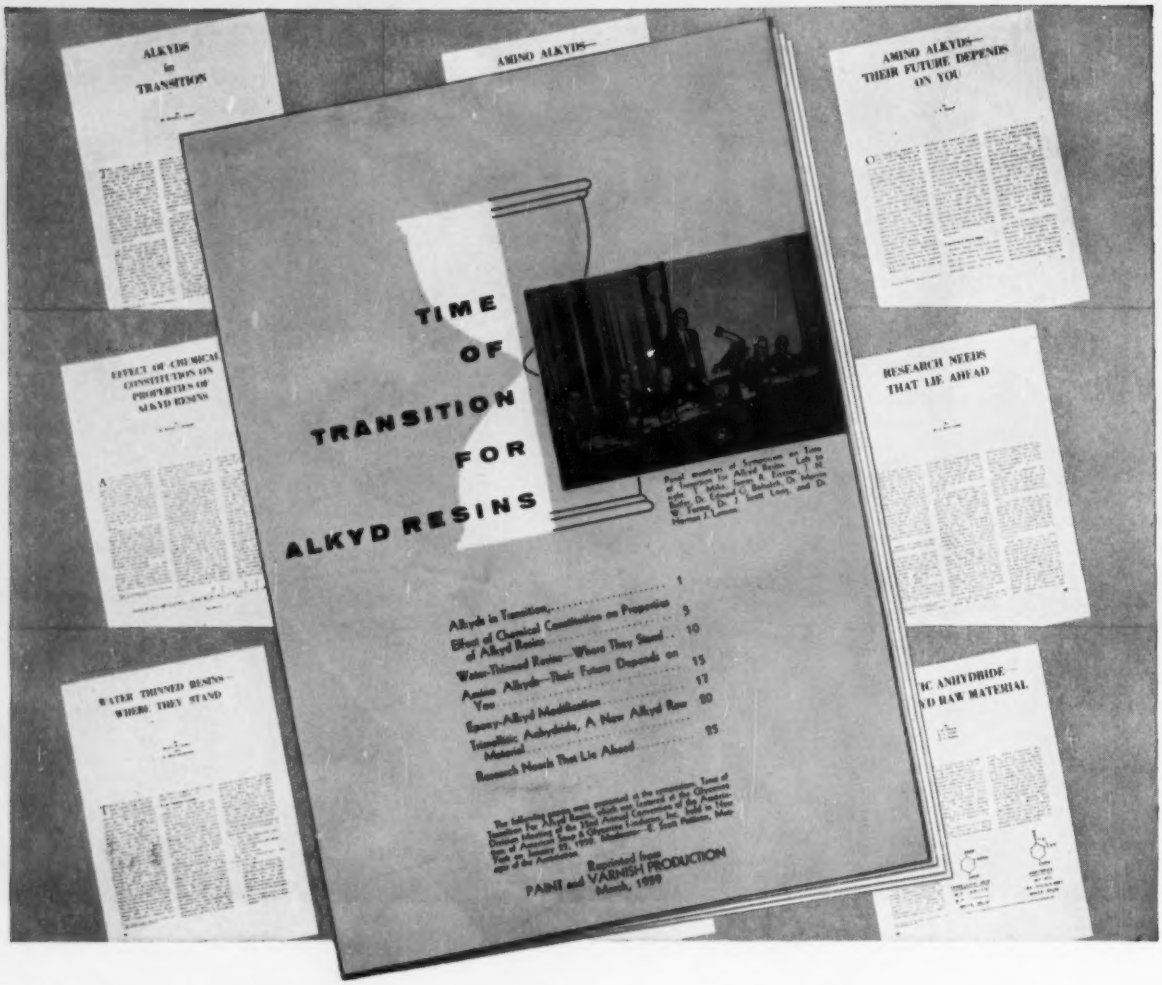
Please send further information on Neville Chemicals.

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Report from the Glycerine Symposium

"Time of Transition for Alkyd Resins" reflects glycerine's continuing partnership with alkyds. It's a 28-page report by seven paint industry experts of new trends in alkyd resin technology.

Glycerine's versatility is unmatched. It goes to any oil length, permitting polyol inventories to be reduced to a single multipurpose material—glycerine. For the future, glycerine alkyds promise to give coating manufacturers a whole new spectrum of properties to work with.

Reprints of "Time of Transition for Alkyd Resins" are available on request. For your copy, write the Glycerine Producers' Association.

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ADVANTAGES THAT COME WITH . . .

Glycerine

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CW PHOTO—LIONEL CRAWFORD

Seeking new electronic systems via printed circuits is only one of many jobs for chemists as . . .

Electronics Raises Its Chemical Stake

Is the chemical industry missing a bet by not doing more electronics-oriented research? Demand for chemical research by the electronics industry is steadily growing—and it's being satisfied largely from within. Five of the big companies in this field employ a total of 1,750 chemical researchers, compared with 515 nine years ago. All are expanding their chemical activities.

Electronics companies are doing this work because of a feeling that no one else will. A Bell Labs spokesman explains, "We know more about our problems than any supplier would be willing to find out." So Bell has plunged deeply into detailed studies of the materials it uses most—plastics, metals and alloys, finishes, crystals, semiconductors, to name a few.

The Bell System finds that small cuts in equipment production and maintenance costs mean big total savings. But it must do its own corrosion and other chemical research because —says Bell—"the cost of further study on the supplier's part is often not reflected in increased markets for him."

Bell's outstanding research has been in solid-state phenomena, which led to its discovery of the transistor. Now the company sees the brightest future for its chemical research in materials capable of performing circuit functions (e.g., synthetic rubies for new amplifiers)."

IBM, biggest in the computer field, is far from dependent upon outside sources for both materials and research.

IBM's director of research, E. R. Piore, reveals that his firm's chemical interest is primarily in finding, purifying and producing research quantities of intermetallic semiconductors.

Other fields of interest: ferrite, for computer "memory units"; and cryogenics (because of the superconductivity of some materials at extremely low temperatures).

Branching Out: During the past five years, National Cash Register Co. (Dayton, O.) has tripled its complement of chemists and chemical engineers—they now comprise 60% of its research staff. NCR makes electronic data-processing systems, bank automation equipment, adding machines and electronic business machines—and is branching out.

Chemist Robert Chollar, NCR vice-president in charge of research and development, reports: "Chemistry is being brought to bear on many research functions that have tradition-

* Bell Telephone Laboratories (serving Western Electric and other AT&T subsidiaries), Sylvania Electric Products (division of General Telephone), International Business Machines, General Electric, National Cash Register.

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ally been thought of as essentially physical." He's interested, for instance, in what chemistry can provide in the way of energy conversion principles to supplant mechanically moving parts and manual energy.

NCR's encapsulation process is a dividend of its chemical research. Seeking to eliminate the need for ink ribbons in business machines, NCR chemists developed a process of coating forms with two chemicals: a colorless lactone of a triphenylmethane dye; and an activated clay that accepts electrons.

To prevent premature color reaction, the lactone is enclosed in billions of microscopic capsules. When these capsules are struck by the typeface of a printing mechanism, they rupture, allowing the transfer of electrons from the lactone to the clay. The lactone then assumes a colored (blue) form.

Carbonless, multicopy business forms are now a multimillion-dollar business of NCR. And the principle of encapsulation also looks promising, NCR says, in making tasteless liquid drugs; producing more easily stored, easily handled jet, rocket and missile fuels, and manufacturing prepared food products (e.g., cake mixes), nonsticky adhesives, etc.

The same process is the key to NCR's "chemical memory" for computing devices. It is based on the principle of photochromism—the sensitivity of certain synthetic dyes to different wave lengths. The dyes are encapsulated and applied to paper. Coded dots of color appear under a beam of light, are "read" by a neutral wave length, "erased" by another wave length—literally a tiny chemical switch duplicating the role of the vacuum tube, transistor, or magnetic memory core.

NCR is also researching electroluminescent phosphors for use with photoconductive units to produce more-economical printed circuits. A recent NCR development is a glass rod about 15 thousandths of an inch in diameter, which is magnetically coated through an electrochemical process. The rod can switch at a speed of 4 millimicroseconds, has an operational temperature range of —100 C to 200 C. These rods permit



UPI

New Research Center's Novel Nucleus

This doughnut-shaped technical information (library, conference rooms, cafeteria) building is the hub of a new, $10-million research center in San Diego, Calif. It is the John Jay Hopkins laboratory for pure and applied science, an operation of the General Atomic Division of General Dynamics Corp. The two-story science buildings will house research in metallurgy, chemistry, experimental physics, engineering development and reactor physics. Other buildings on the 300-acre site are for engineering and metallurgical development, a reactor, and other nuclear research facilities.

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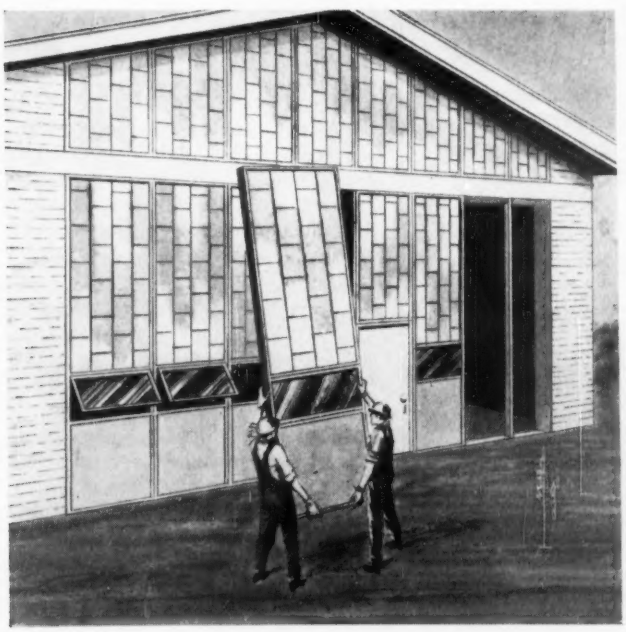
Sound. SANPAN—colorful, translucent sandwich panels by Panel Structures, Inc. of East Orange, N. J. stand among the most stimulating ideas recently introduced to the building industry. Soundly constructed of reinforced Fiberglas skins lastingly bonded to welded aluminum frames with Thiokol-base adhesive, they help meet architecture's need for new, different, yet practical structural materials.



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For more information, send coupon to Thiokol Chemical Corp., Dept. 21, 780 N. Clinton Ave., Trenton, N. J. In Canada: Naugatuck Chemicals Division, Dominion Rubber Co., Elmira, Ontario.

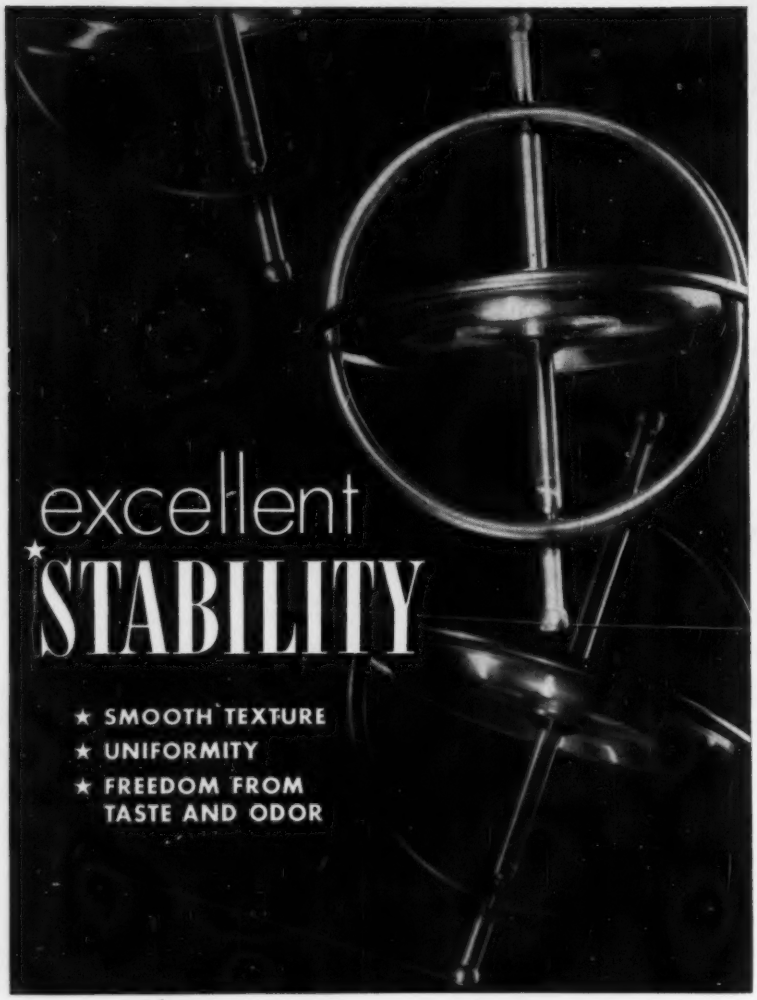
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storage of at least 8,000 bits of information in a memory unit the size of a cigarette package.

Chemical Competition: General Electric and Sylvania illustrate the potential commercial scope of such internal chemical research. GE sells a variety of chemicals and plastics, has developed a process for making synthetic diamonds, new silicone wire insulation, cross-linked polyethylene among other research achievements. Thanks to its metals research, Sylvania offers tungsten and molybdenum ingots, high-purity germanium and silicon.

Guy Suits, GE vice-president and director of research, says, "It might come as a surprise to many that GE's research laboratory (Schenectady) includes more Ph.D.s in chemistry than in any other field of specialization." Sylvania has trebled its staff of research chemists since '50, has 300.

Sylvania's director of scientific liaison, Henry O'Bryan, declares, "We would rather have our own chemical staffs and laboratories, because it results in better integration with production and sales. We are continuing to expand our chemical research activities, particularly in the fields of metallurgical processing, luminescence, new semiconductor and microwave materials."

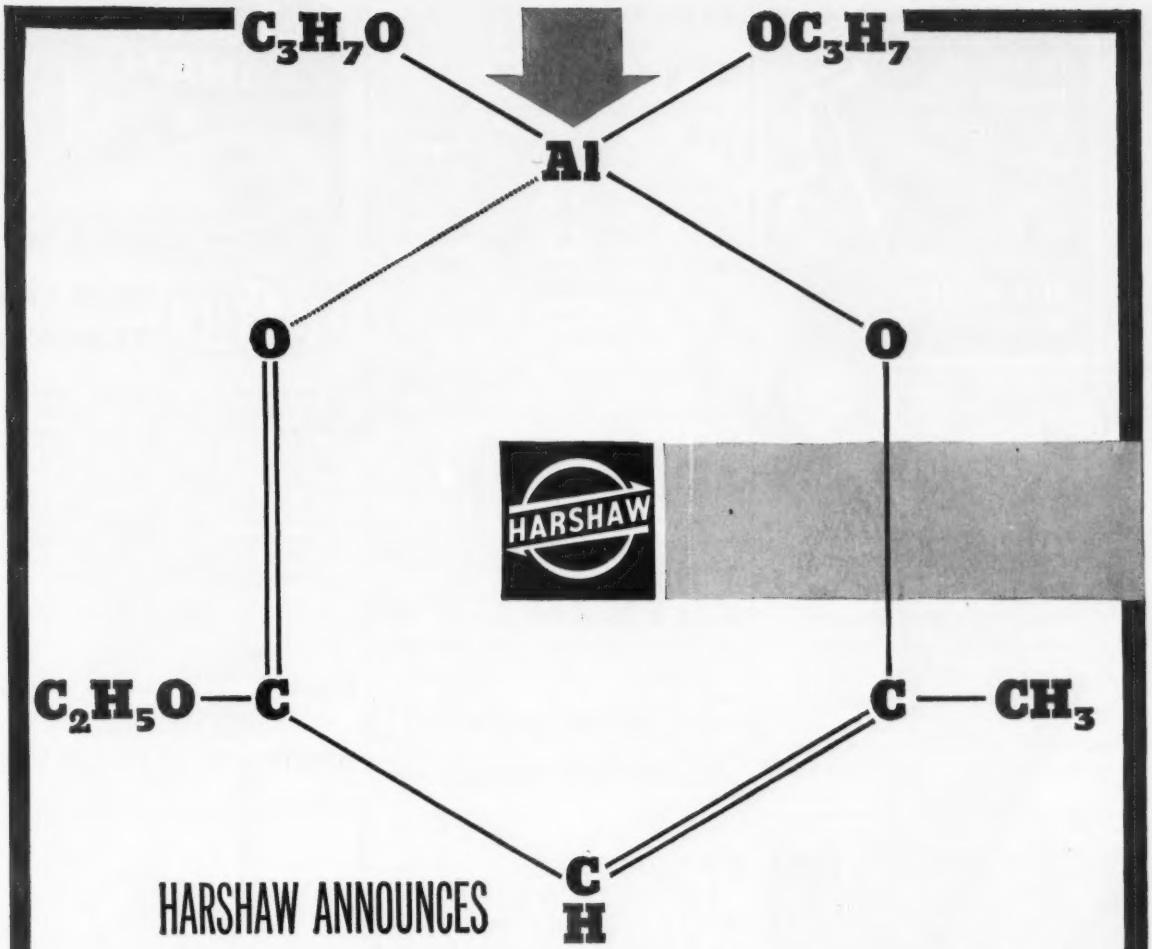
New avenues of profit await chemical companies that can spot opportunities for productive participation in the electronics industry's swelling research effort.

Water Saver

Research completed last week on a chemical method to minimize the evaporation of water from reservoirs indicates that a practical and economical answer may be available in the near future.

Dept. of the Interior scientists mechanically suspended a dry-powder form of hexadecanol on Lake Hefner (a 2,500-acre reservoir for Oklahoma City), forming a "shield" on the water. Result: evaporation was reduced 9%.

The three-month experiment cost about $60 for chemicals and labor to save one acre-foot of water—close to the price of water in that region. But DI scientists claim they can cut costs to as low as $25/acre-ft. One remaining problem—winds over 20 mph. break up the film.



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Viscosity... W-X (Gardner Scale)
Specific Gravity....1.035@25°C
Weight Per Gallon.....8.6

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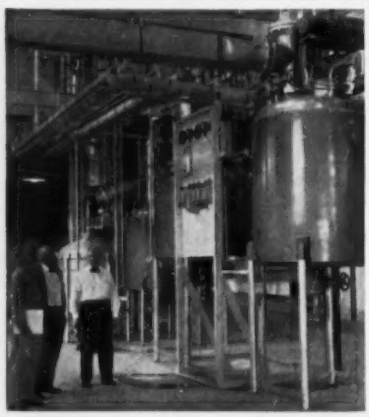
We have prepared a Technical Data Sheet which describes the characteristics of Harshaw Aluminum Chelate PEA-1, and also discusses suggested applications. A copy of this can be obtained by contacting the New Products Department, The Harshaw Chemical Company, Cleveland 6, Ohio.

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RESEARCH

EXPANSION

• Minnesota Mining & Manufacturing Co. (Minneapolis) is building two wings to its research center. Cost: $700,000.

• Dow Chemical Co. (Midland, Mich.) plans an agricultural research center in that city. It's scheduled for operation in the summer of '60, supplementing facilities at Seal Beach, Calif., and Freeport, Tex.

• Eastman Kodak Co. (Rochester, N.Y.) has completed its high-pressure laboratory designed for research into new chemical reactions up to the 30,000-psi. range. The lab building is fitted with closed-circuit TV for safe viewing of reactions.

• Radiation Engineering Services (Norristown, Pa.), a new firm, offers regularly scheduled training programs in nuclear sciences, designed for various audiences. Fees: $150 for one-week sessions; $300 for two-week sessions. Courses include: isotope radiography, basic nucleonics, applied nucleonics, nucleonics for the executive, tracers and radiochemistry, isotope gauging.

PRODUCTS

Food Enricher: Thiamine diacetylsulfate is available from Byron Chemical Co. (Long Island City, N.Y.). It's suggested for use in medicinal products, and as a food additive.

•

Organic Sulfur: A new item from Evans Chemetics Inc. (New York) is benzyl mercaptan (α-toluenethiol). Possible uses include high pressure lubricating additives, antihistamines, polymerization activator, and as a stabilizer for polysulphones.

•

Antihistamine: White Laboratories (Kenilworth, N.J.) has developed "an almost pharmacologically pure form of histomine antagonist," dexbrompheniramine maleate. It's called Disomer, reportedly has greater therapeutic effect, less side effects than earlier antihistamines.

•

Tritium-Labeled Sugars: Sugar and sugar derivatives having a radioactive isotope of hydrogen—tritium—are available from the National Bureau of Standards, Washington, D.C., for $10/100 microcuries. Suggested use: in tracer studies.



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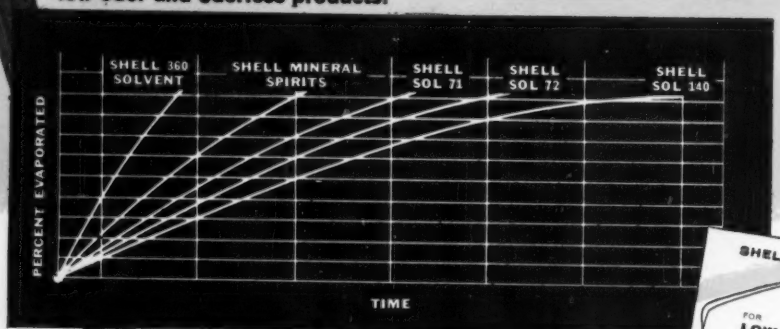
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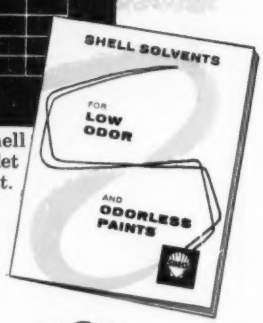
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SHELL

Technology
Newsletter

CHEMICAL WEEK
July 11, 1959

Tennessee Eastman's plan for a 900,000-cu.ft./day hydrogen plant at Kingsport, Tenn., throws more light on the production of Kodel fiber. While TE (a division of Eastman Kodak) hasn't disclosed many details on Kodel polyester fiber, a recent patent (U.S. 2,887,468) mentions use of purified hydrogen in making copolyesters. Example 1 of the patent illustrates a reaction between *p,p'*-sulfonyl dibutyric acid dibutyl ester, dimethyl hydroxyterephthalate, and pentamethylene glycol in a reaction vessel equipped with an inlet for purified hydrogen. Titanium tetrabutoxide in butanol is added as a catalyst, and the mixture is stirred into a stream of hydrogen, treated further to obtain "a high-viscosity polyester."

Girdler Construction, division of Chemetron Corp. (Louisville), will build the plant, which is scheduled for completion in late '59 or early '60. The hydrogen will be made from natural gas, will be produced in 99% purity, Girdler says.

•

Dow and Heyden Newport have snared new jet lubricant contracts with the Air Force. They will supply the synthetic lubes for engine testing.

Heyden's neopentyl glycol ester lubricant (Pentalube TP 653) has passed 100-hour engine testing at 425 F to tighten its race with Celanese's trimethylol propane ester to be the lube of choice for Mach 3 aircraft (*CW, April 4, p. 83*). Now the Air Force has contracted to obtain "substantial quantities" for further testing.

There's a chance the new lube may supplant oils used in present jet aircraft. If this use materializes, Heyden Newport President Simon Askin believes, the newcomer "could take a sizable share of the '60 consumption of synthetic lube oils now projected at over 2 million gal."

Dow will produce 5,000 lbs. of bis(phenoxyphenyl) ether and bis(phenoxyphenoxy) benzene for the Wright Air Development Center (Dayton, O.). The compounds will be evaluated as high-temperature, radiation-resistant lubricants. Both withstand up to 600 F in an oxidizing environment such as air, up to 900 F in a nonoxidizing (e.g., nitrogen) atmosphere. Both will be made at Dow's pilot plant in Midland, Mich.

•

A new name in saline-water conversion is Weir-Chicago Bridge, jointly owned subsidiary of G. & J. Weir Ltd. (Glasgow, Scotland) and Chicago Bridge & Iron Co. (Chicago). The new firm will have headquarters in New York, be under the direction of William Vandersteel, currently Weir's resident manager.

Weir—which supplied the distillation units for the 2.7-million-gal./day, Singmaster & Breyer-designed plant on the Caribbean island of Aruba—recently won a contract to supply Kuwait with two 1.2-million-gal./day flash evaporators for $1.7 million, or about 70¢/daily gal. (*CW*

Technology Newsletter, May 9). The company says that it has installed plants producing 12 million gal./day of fresh water, or more than two-thirds of the total installed world capacity.

•

A lightweight chemical vacuum "pump" is the key to an ultra-accurate atomic clock the National Aeronautics and Space Administration hopes to put into orbit around the earth. The timer, an ammonia maser clock (microwave amplification by stimulated emission of radiation) being developed for NASA by Hughes Aircraft Co., will have an error of less than three seconds in 3,171 years. It will be used to test Einstein's special law of relativity, which suggests that such an orbiting clock will differ from a stationary clock on the earth—by about one second in 60 years at the proposed satellite's speed.

The novel pump will be used in place of a conventional—and heavier—mechanical and oil-diffusion vacuum pump. It employs a solid shell of undisclosed material that reacts vigorously with ammonia to form a solid, thereby maintaining the vacuum and preventing molecular collisions.

•

Details on making sugar-based surface-active agents are out, in a new patent (U.S. 2,893,990) assigned to Sugar Research Foundation, Inc. (New York). The products are fatty acid esters of sucrose made by alcoholysis reaction between sucrose and an ester of fatty acid. A mutual solvent is required to dissolve both sugar and ester. The best: dimethylformamide for reasons of cost, availability, solvent power, ease of recovery, separation from product, and lack of reactivity with reagents and reaction products.

•

Here's more on Henkel's direct benzene-to-terephthalic acid process (*CW Technology Newsletter, June 27*). The heavy-metal catalyst has been identified as cadmium; reaction temperature is 350 C. In addition to benzene and potassium carbonate, the reaction mixture contains aluminum carbide, which absorbs moisture and produces an atmosphere of methane gas.

The first licensees to produce terephthalic directly from benzene by the new route are the Japanese firms of Kawasaki and Teikoku. Others licensed by Henkel: Badische Anilin- & Soda-Fabrik (Ludwigshafen, Germany), Britain's Imperial Chemical Industries, and Hercules Powder.

•

First commercial production of hydroxymethyl furfural from waste wood will be started by a big Eastern producer of phenolic molding compounds early next month. Object: to cash in on the compound's high reactivity, particularly its potential in resins, and the growing abundance of waste wood. Keys to the process are in U.S. patent 2,851,468, assigned last year to Dendrol, Inc. (Memphis, Tenn.); Dendrol hasn't revealed the name of its licensee.

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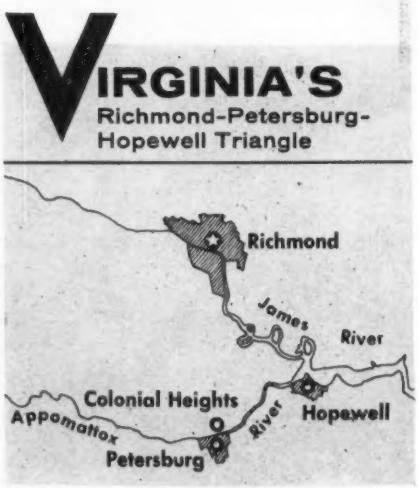


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Riverboat tour of valley gets early morning start at Marietta, as industrial development men board.

Site Boosters and Buyers Barge the Ohio

On two hot and steamy days last week, industrial development managers from 10 chemical process companies joined 121 colleagues from other industries for a riverboat site-seeing tour of the upper Ohio River. The trip, sponsored by the Upper Ohio Valley Development Council and related groups, was designed to "sell" plant sites on the undeveloped land along 130 miles of the river from Marietta to East Liverpool in Ohio.

Besides plants of such chemical firms as B. F. Goodrich, Union Carbide, American Cyanamid, Olin-Revere Metals, Columbia-Southern and Titanium Corp. of America, the managers saw 18,079 acres of river-front property comprising 20 prime sites varying in size from 22 to 8,600 acres. To balance the serious aspects of the tour, there was entertainment that included a concert by the New Matamoras, O., high school band, a truck-borne calliope, a Sea Scout "Indian attack," televised views of the traveling boat, and absorbing lectures on riverlore and area folklore.

Point of Interest: Although no sites were bought during the trip, the industrial site-seekers did get an up-to-the-minute view of the bustling activity along the river. This includes a $300-million chemical plant investment; it is the region's third largest industry, after power and steel. Representatives of each town and industry, as well as those of the Army Corps of Engineers — caretakers of the river system — regaled the audience with facts and figures about the upper Ohio.

Focal point of interest, of course, was the river itself, from the standpoint of both transportation and as an abundant source of process and cooling water. Highlights:

- The river is being improved to allow larger barge tows. At New Cumberland, for example, dual locks and a new dam will permit passage of 1,200-ft tows. Only 600-ft. tows can be handled now.
- Stringent antipollution laws are gradually forcing towns and industries to clean up effluent, make water more usable.
- Flood-control projects are reducing the likelihood of flood damage.

Another industrial development project: electric power is being increased at many points. Adjacent to the New Cumberland lock project, Ohio Edison is building a giant, 1.25-million-kilowatt generating plant. At Brilliant, O., Ohio Power Co.'s 345,-000-volt interconnection system brings together circuits for Steubenville, Tiltonsville, Canton, Smithfield, Cadiz and Brilliant, O., and Natrium, W.Va. Other plants are being expanded; 25 riverside power stations now deliver 9.25 million kw.

Highway and rail systems are being expanded. Work under way on Ohio Route 7 along the river between Steubenville and Marietta will give the highway four lanes by '61.

A major deterrent to industrial expansion has been lack of rail facilities along the Ohio side of the river, but this may soon be corrected. Pennsyl-

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Army Engineers helped lecturers

vania Railroad, along with Hanna Coal Co., has 7,000 acres between Omal, O., and Marietta, says it will lay tracks between the two towns to augment those it laid from Steubenville south to Omal (to serve the new Ormet plant). It will be the first new trackage in Ohio in nearly half a century. Starting direction depends partly on where development starts.

Labor supply is plentiful in the valley, largely because farming is becoming more of a marginal livelihood. Willing hands, say Ohio developers, are coming from the farm to the industrial areas. In a recent study, for example, companies in the West Virginia sector of the Wheeling-Steubenville metropolitan area reported 5,299 active applications on file for jobs. At Parkersburg, W. Va., the total was 2,986. During last year's recession, the region was considered a critical unemployment area.

Moreover, nearby markets are large. Estimated buying power in the neighboring 11-state area: $28 billion.

Variable View: Naturally, the desirability of an upper Ohio Valley industrial site varies with the industry and its products. Several aspects of the area require careful analysis.

The labor picture is one example. The area is the heart of the steel industry that outproduces Germany's celebrated Ruhr Valley three-to-one. Wage rates tend to follow patterns set in steel. In June '59, skilled male workers at East Liverpool were getting $1.75-2.60/hour, at Gallipolis, $1.50-2.50, at Steubenville, $2-3, and



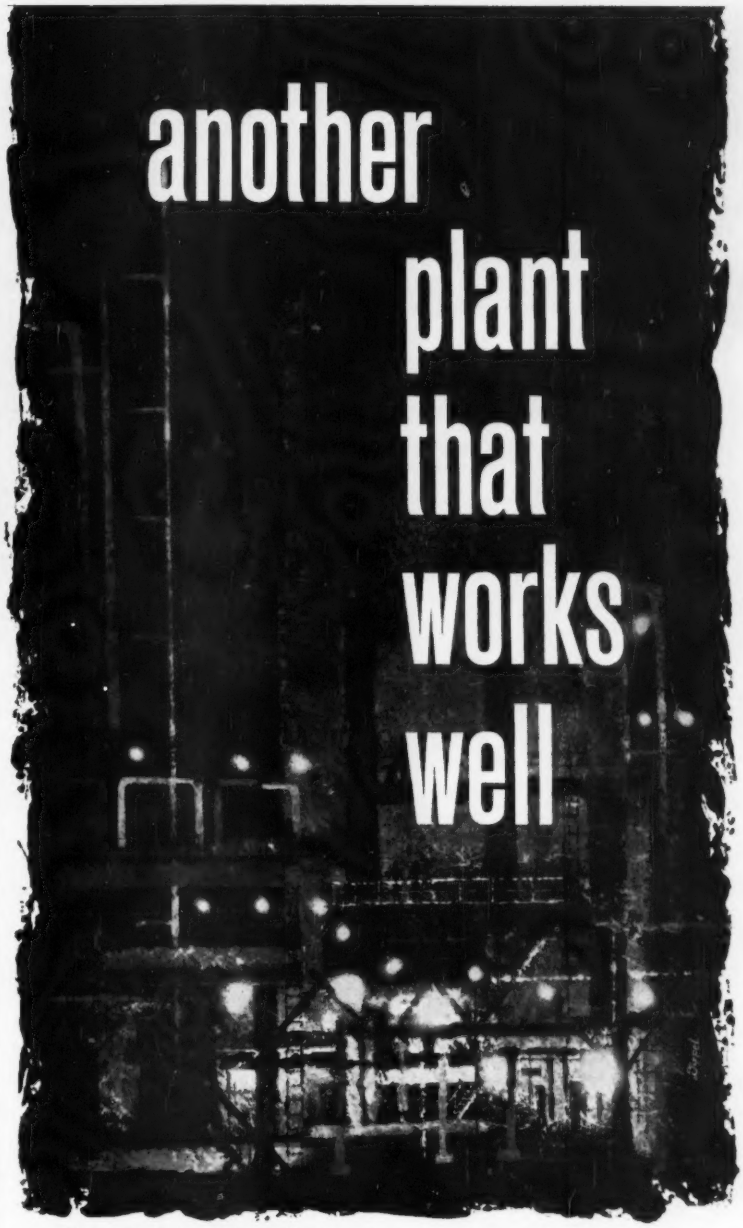
ell the story of the valley region.

at Marietta, $1.50-2.75. Figures compiled by the U.S. Bureau of Labor Statistics show that U.S. chemical and allied products employees in Jan. '59 were making an average of $2.37/hour; the average in industrial inorganic chemicals was $2.63.

Although some work is started and more is planned for improving highway facilities, the major highway routes serving the area are now pretty well crammed, according to site-seekers. A recent major improvement is the new bridge at St. Mary's, W. Va., that links the two riverbank highways.

Another consideration, of course, is the flood problem. Unquestionably much has been done to control the river since serious flood years of '13 and '37. Nevertheless, plants must still be planned with an awareness of flood danger. For example, Sylvania Electric has related how it was able to keep flood damage to a minimum during the high waters last January, even maintaining shipments and operations. But this was accomplished more by Sylvania's careful planning than by actual control of the flood by dams and reservoirs. It's said also that Ormet, in building its giant aluminum plant, used fill to raise its ground level about 13 ft. to avoid possible inundation by unruly waters.

But such disadvantages are perhaps outweighed by the area's good points. How soon chemical management increases its migration to the region may depend largely on the success of the new campaign.



The reason is still simple. Sound engineering, right from the start. Early joint efforts between company researchers and contracting engineers meant both quick start-up and a trouble-free plant design that has not and will not become dated.

Today, several top-flight process engineering firms serve the complex chemical industry. Vitro is one of these—*with an important advantage.* It has specialized in the hard-to-do jobs; the ones which haven't been done before or at best are new processes fresh out of the lab. This is Vitro's unique contribution.

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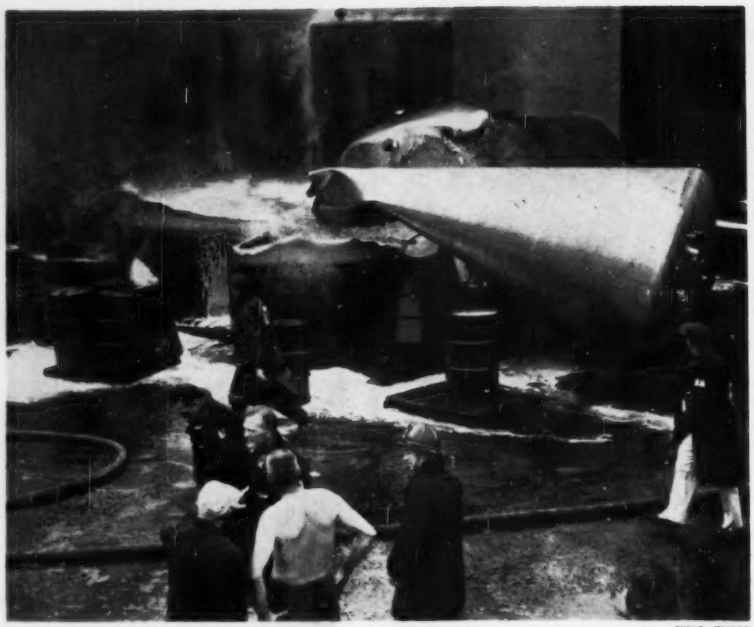
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WIDE WORLD

When plant trouble hits, management must be fast with full facts.

Planning Allays the Panic

When plant disaster hits, the wail of sirens is often followed by community panic. Much of this can be prevented by quickly spreading the full facts of the accident, using local press and radio. Simple as this is, three serious CPI accidents in recent weeks show that community-relations groups vary widely in their ability to meet these emergencies.

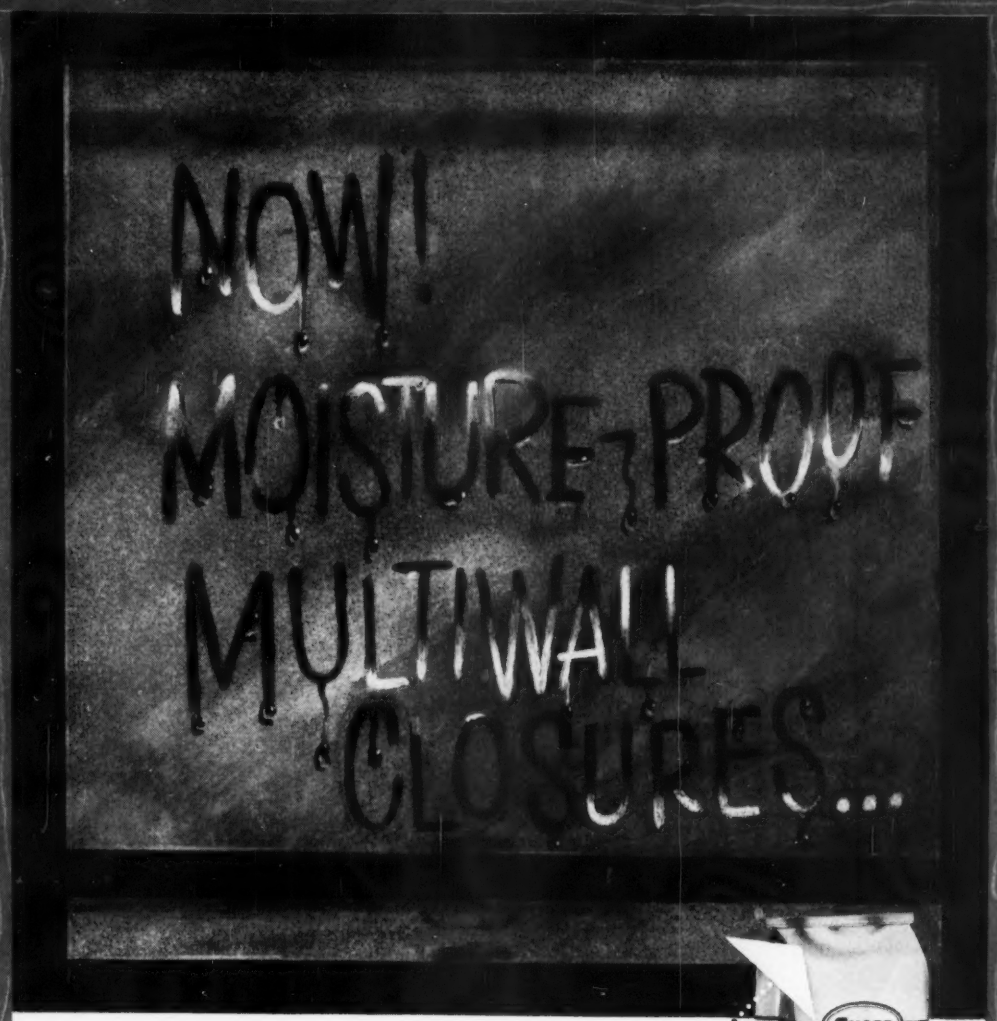
• When an explosion at Foote Mineral Co.'s electrolytic manganese plant at Knoxville, Tenn., blasted two workers into an acid vat, killing both instantly, the local press was able to treat the accident factually. It got full information from the assistant plant manager. He was able to act quickly, in the plant manager's absence, largely because of a previously issued "instruction sheet" from public relations headquarters in Philadelphia outlining treatment of the press in various situations, including disasters.

• When sulfur trioxide gas escaped from Allied Chemical Corp.'s General Chemical Division plant at Denver, press treatment was alarmist. The gas escaped at 10:15 p.m., June 26; by 4:28 a.m., an Associated Press bulletin reported that a thick murky cloud of sulfur dioxide had spread over parts of Denver causing illness in many homes, snarling traffic over three-quarters of the city.

To counter rapidly spreading rumors, public relations personnel in New York contacted top management, framed a statement for release by the Denver plant superintendent, called and wired major municipal dailies, radio stations and the wire services. Lesson learned was that no incident, however small, should be assumed to have escaped press notice and that plant management's evaluation of the emergency must be released locally as soon after the incident as possible.

• When two large tanks of synthetic resins at American Alkyd Co.'s Carlstadt, N.J., plant reportedly exploded (*see picture*) press treatment was divided. According to company owner and president, Charles Hauck, one local newspaper gave a factual account, another distorted the truth. But Hauck, who was out of town at the time of the disaster, had no set of instructions for such emergencies. He sees "no reason" for one.

Plant accidents are inevitable, but managers are finding out that the damage resulting from fire and explosion is often minor, compared



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with the damage to community goodwill resulting from poor press relations.

The single proved way to help reports following a disaster is by providing plant management with basic instructions for dealing with the press—and emphasizing that someone in authority must be ready at all times with complete information.

LABOR

Cement Contract: Employees of the Louisville Cement Co. have accepted a wage increase averaging 10¢/hour, setting a new pay range between $2.03 and $2.72/hour. Employees at the Speed, Ind., plant were represented by the Cement Workers Union.

•

Labor Merger: At Louisville, Ky., delegates representing some 50,000 unionists completed formalities merging the former AFL and CIO central labor bodies in the area to form the Greater Louisville Central Labor Council. The Louisville area employs more than 60% of union members in Kentucky.

•

Hearing Sought: A hearing before the National Labor Relations Board has been sought by the United Glass Workers to determine eligibility of different unions—American Flint Glass Workers, Allied Industrial Workers, Window Glass Cutters League, and District 50, United Mine Workers—to represent workers at the Mount Zion, Ill., plant of Pittsburgh Plate Glass Co. United Glass Workers claims it has signed up more than 200 of the 285 production and maintenance workers at the new plant, which is now operating about 60% of capacity.

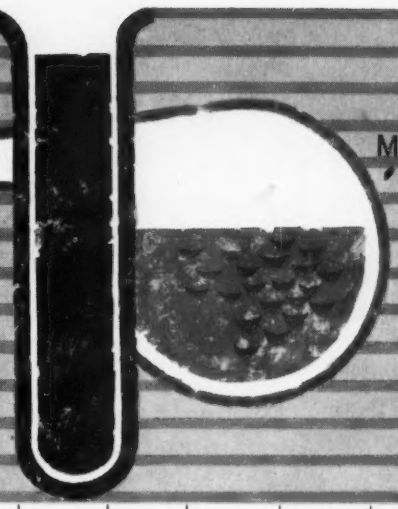
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Oil Strike: Following a union vote, the American Oil Co. refinery at Texas City has been struck. Contract negotiations were broken off by Local 4-449, Oil, Chemical & Atomic Workers, representing 1,300 workers. Also on strike, 373 American employees in Local 8-434 at El Dorado, Ark., refinery. Principal issue: the right of management to direct and utilize employees most efficiently. American granted a 5% wage increase earlier this year.

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Ammonium Citrate	✓	✓	✓	✓					
Gluconic Acid	✓	✓	✓	✓				✓	
Glucono Delta Lactone	✓	✓	✓	✓				✓	
Sodium Gluconate	✓	✓		✓				✓	
Oxalic Acid	✓	✓	✓	✓	✓		✓	✓	
Ammonium Oxalate	✓	✓		✓					
Ferric Ammonium Oxalate									✓
Tartaric Acid	✓		✓	✓				✓	
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Excellent complexing agent for copper in electroplating.

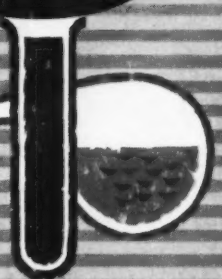
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ADMINISTRATION

KEY CHANGES

R. William Bjork to director, Norda Essential Oil and Chemical Co. (New York).

John M. Zabkar to manager, manufacturing operations, Commercial Production, Sylvania-Corning Nuclear Corp. (Bayside, L.I., N.Y.).

W. Alton Jones to executive committee chairman; **Burl S. Watson** to board chairman and chief executive officer, **J. E. Warren** to president **A. P. Frame, Charles S. Mitchell** and **George H. Hill, Jr.,** to senior vice-presidents; **Erle G. Christian** and **Edward L. Stauffacher** to vice-presidents; **Frank K. Foster** to secretary; all of Cities Service Co. (New York).

E. S. Twining, Jr., to vice-president —marketing, Air Reduction Sales Co., division of Air Reduction Co. (New York).

E. Charlton Crocker to manager, applied research and development; **H. W. Spaght** to vice-president in charge of personnel; Nalco Chemical Co. (Chicago).

Frank W. May to vice-president and general manager, Ansbacher-Siegle Corp., division of Sun Chemical Corp. (New York).

H. L. Reichart, Jr., to vice-president and general manager, Carbide Chemicals Co., division of Union Carbide Canada Ltd. (Toronto).

Arthur R. McNeil to director, MacDermid Inc. (Waterbury, Conn.).

H. B. Morley to manager, inorganic research department, Wyandotte Chemicals Corp. (Wyandotte, Mich.).

William D. Wallace, Lowell H. Smith to vice-presidents, Crown Cork & Seal Co. (Philadelphia).

Charles H. Sommer to executive vice-president, director and member of the executive committee; **Robert M. Morris** to vice-president and general manager, Organic Chemicals Division; Monsanto Chemical Co. (St. Louis).

F. C. Nicholson to vice-president, Northern Natural Gas Co. (Omaha).

Harold Blancke to chairman, **George Schneider** to vice-chairman, Celanese Corp. (New York).

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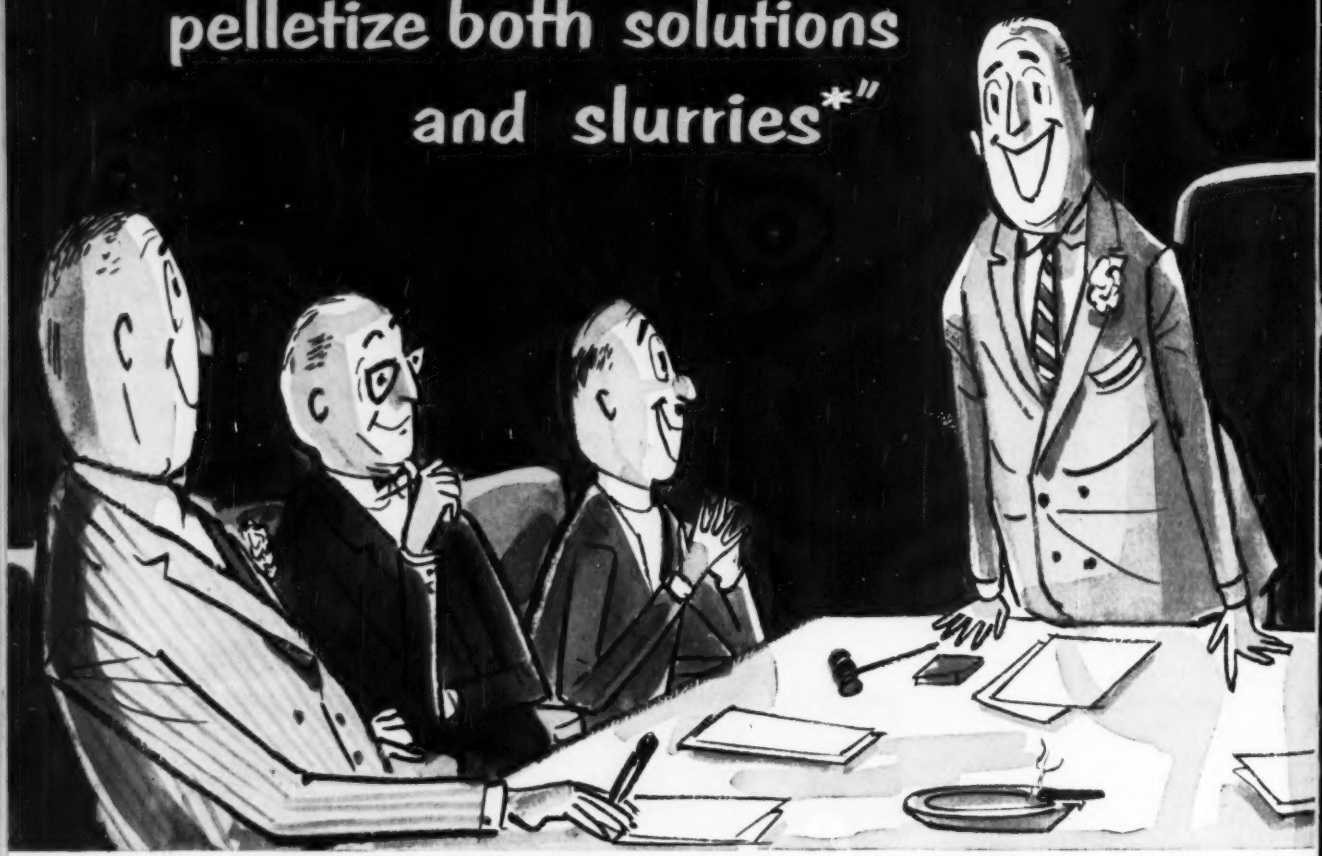
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Market Newsletter

CHEMICAL WEEK
July 11, 1959

First commercial production rate of n-butyl lithium by Lithium Corp. of America at its new plant in Minneapolis will run more than 1,000 lbs./month. (Short-range production capability is believed to be substantially larger.) At the start, the chemical will be priced at $75/lb., but it's likely—though not yet officially stated—that the tab will be slashed to well below $40/lb. within a week as production gets rolling. One reason: Lithium's competitor—Foote Mineral—is now selling "semicommercial" quantities at $37.50/lb. (Foote has had a 1,500-lbs./month-capacity n-butyl lithium unit in operation at Exton, Pa., since early '59.)

Prime market for n-butyl lithium is upcoming polyisoprene—in which n-butyl lithium is used as catalyst—at Shell Chemical's new plant now abuilding at Torrance, Calif. (*CW Technology Newsletter, July 4*). Both Lithium Corp. and Foote Mineral are, of course, vying for a major share of Shell's business; but Shell so far has not settled on its No. 1 source.

Whichever way the scramble comes out, the long-range outlook is promising for both n-butyl lithium producers. Existing production potential isn't enough to meet the likely-to-develop demands of the next year or two in pharmaceutical manufacture and especially in other catalytic processes, such as production of polybutadiene. Already, substantial n-butyl lithium capacity boosts in the next few years appear warranted.

•

Operating rate of Diamond Alkali's new chlorine-caustic facility at Houston, Tex., will initially exceed 50% of capacity. The now-completed 20% capacity boost—one of several pushed this year by the industry (*CW, March 7, p. 113*)—brings the firm's Houston plant to a nominal 750 tons/day of chlorine capacity and a concurrent 825 tons/day of caustic capacity –7.5 million cu. ft./day of high-purity hydrogen can also be produced.

Chlorine demand is good now, and some observers say that further market improvement during the second half of '59 could start another rash of chlorine-caustic expansions. U.S. chlorine output in '60 is forecast as some 4.2 million tons, about 84% of total capacity—close to the capacity/demand balance that traditionally heralds new expansions.

•

Widespread use of "nonapproved" plastic pipe for potable water systems has been branded a potential health hazard and a black mark against the plastic pipe industry as a whole. The problem—long plaguing the plastic pipe industry (*CW, Aug. 9, '58, p. 77*)—was thrashed out last week at the first national Congress of Environmental Health at Ann Arbor, Mich., under sponsorship of the National Sanitation Foundation.

Use of plastic pipe not bearing the NSF seal of approval was strongly criticized by Walter Tiedeman, executive director of NFS Test-

ing Laboratory. Said Tiedeman, the word plastic "covers a myriad of products, including many from which toxic substances are readily extractable by slightly aggressive potable waters."

Suggested solution: cooperative and coordinated effort on the part of public health officials and the plastic pipe industry to foster greater recognition and use of the NSF Seal of Approval program.

•

Almost half of all U.S. coal-tar chemical imports in '58 came from West Germany. The latter's coal chemical shipments to this country increased to 6.9 million lbs., from 4.9 million in '57. Other major exporting countries sent these amounts to the U.S. in '58: Italy, 1.7 million lbs.; Netherlands, 1.4 million lbs.; United Kingdom, 1.2 million lbs.

Smaller quantities came from Belgium, 748,000 lbs.; Denmark, 710,000; Switzerland, 624,000; France, 567,000; Sweden, 292,000; Japan, 166,000; Canada, 108,000.

Most important coal-tar intermediates imported last year were caprolactam monomer, refined naphthalene (*CW, May 9, p. 95*), acetoacetanilide and anthraquinone. Caprolactam imports, for example, totaled 2.7 million lbs. in '58, came from West Germany and the Netherlands.

Imports of pesticides and other organic agricultural chemicals declined to 1.9 million lbs. in '58, from 2.8 million in '57; rubber processing chemicals also dropped off—to 39,000 lbs., from 166,000 in '57.

•

Some CPI observers close to the atomic energy business are uneasy about uranium market prospects after the '62-'66 government contract period expires, are more cautious about setting up new plants to supply processing raw materials; this go-easy attitude contrasts with recent observations that forecasts of world uranium demand should be rivised upward (*CW Market Newsletter, May 23*).

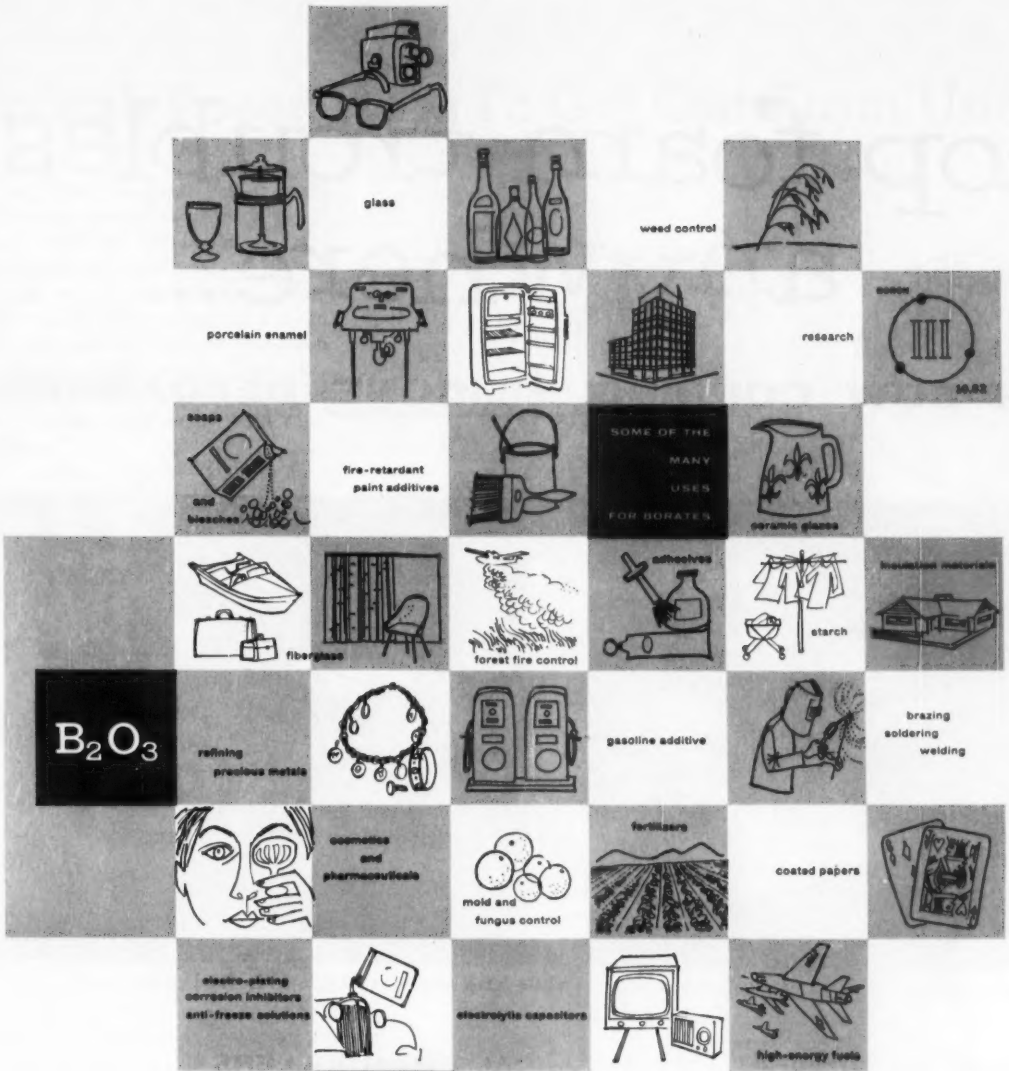
•

American Cyanamid has started producing its acrylic fiber—Creslan—at the firm's new, $27-million plant near Pensacola, Fla. Major raw material, acrylonitrile, comes from Cyanamid's Fortier, La., plant.

SELECTED PRICE CHANGES—WEEK ENDING JULY 6, 1959

	Change	New Price
UP		
Borax, tech., anhd., 99½%, bgs., ton	$4.50	$92.00
N-Butyl alcohol, tanks	0.005	0.15
Isobutyl alcohol, tanks	0.005	0.14
Styrene monomer, tech., 99.2%, tanks	0.003	0.12

All prices per pound unless quantity is quoted.



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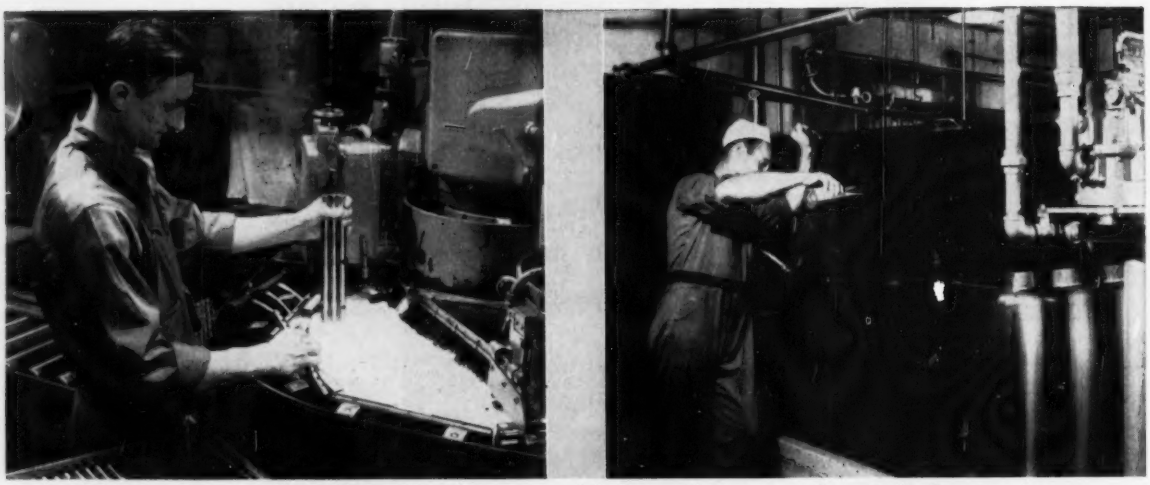
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Potash Poser: How To Get Out From Under?

Last week, National Potash made a precedent-setting move to step out from under the frenetic market-juggling problems that beset the potash industry as a whole. NP joined hands with a cooperative organization in an effort to establish smoother production to sales channels—a move that other harrassed U.S. potash producers are watching with undisguised forebodings.

Essentially, what National has done is to contract with Chicago-based Central Farmers Fertilizer Cooperative to have CFFC distribute what amounts to about all of National's productive capacity. National's gain: firm prices, reduced distribution costs. This contract is part of a deal by which CFFC bought an estimated 10% of National stock—equal amounts coming from National's co-owners, Freeport Sulphur and Consolidation Coal (*CW, Dec. 20, '58, p. 62*).

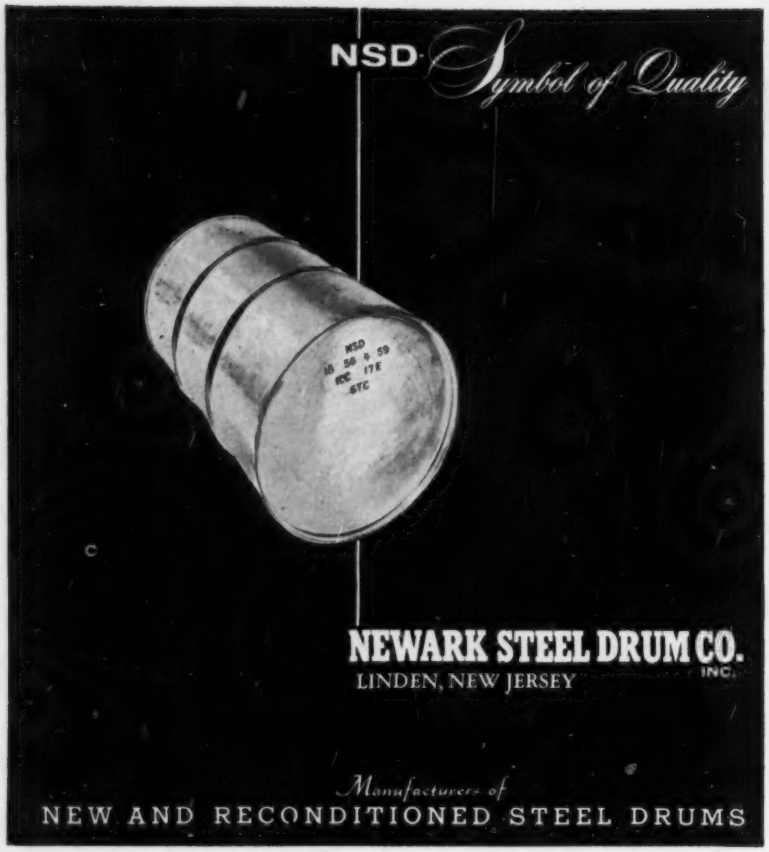
And what has given the industry misgivings is not only CFFC's purchase of a minority of National stock but also its agreement to buy still more of this stock. Freeport and Consolidation say there's no intention to let CFFC gain control of the company, as feared by the industry.

As the agreement stands now, National isn't committed to sell all its potash through CFFC—but it probably has little excess to sell elsewhere. And National can supply independent buyers on its own if it wants to, but that is regarded as unlikely.

Because CFFC membership is expected to grow faster than the fertilizer market itself, the long-term outlook is for greater CFFC-NP strength at the expense of other producers. But there are immediate repercussions as well—notably a scramble for the non-CFFC business (estimated at roughly 150,000-200,000 tons/year of potash) dropped by National. But this business picked up by other producers isn't all gravy for them—it must help offset the former CFFC business now lost to them. And it's a safe bet that National expects to come out ahead, tonnage-wise, in the customer shuffle.



Overcapacity Headache: Although



MARKETS

National's immediate problem is solved, not many others in the industry are in a similarly good position. The U.S. potash industry's chronic overcapacity (estimated 25%) will likely get worse before it improves. One indication: planned opening of a new, 1,500-tons/day mine in Utah by Delhi-Taylor (*CW, June 20, p. 86*). Note: potash overcapacity estimates are often conservative, because most producers could, if pressed, produce much more than their "rated" plant potash capacities.

Potash deliveries in the U.S., Canada, Cuba, Puerto Rico and Hawaii by eight U.S. producers reporting to the American Potash Institute totaled about 3.8 million tons of salts (containing almost 2.23 million tons of K_2O) in '58; that represents a 10% increase over '57.

Although potash production and consumption are increasing, business probably won't pick up fast enough in the next few years to offset the expected capacity boosts.

Canada Looms Big: This is especially true in view of Canada's growing role as a potash producer. But there are many factors that are as yet too nebulous to permit accurate forecasting of the impact of Canadian potash on North American markets.

It's clear, for example, that the U.S. Midwest will be one of the prime market areas for Canadian potash. Freight cost from Canadian mines to consumption centers in the U.S. Midwest are just about the same as from Carlsbad, N. M.

Just how soon and to what extent the Canadian potash will hit the U.S. is moot. A sudden influx could result in curtailment—perhaps complete closing—of mines by some producers in New Mexico. Most of these producers, however, are digging the Canadian mines—the source switch would amount to pulling potash from one pocket instead of another. For that reason, other factors will likely affect timing of Canadian imports.

U.S. labor, standing to lose more than the companies should there be closings in New Mexico, might push for tariff protection. But the labor situation is complicated by the across-the-border nature of the potash labor organization; attempts to protect jobs in the U.S. could strain relations with the Canadian faction of the labor organization.

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- 5-Diethylamino-2-aminopentane
- Diethylacetamidomalonate
- Diphenylacetonitrile
- Ethylacetamidocyanoacetate
- Gramine
- Indole-3-Acetic Acid
- m-Hydroxypropiophenone
- Malononitrile
- 2-Mercaptothiazoline
- 3-Methylthiophene
- Phenylcarbethoxypyrazolone
- Phenylmethylpyrazolone
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National Potash is one of those firms that have an interest in Canadian potash; but it has not yet started a mine. National has obtained from the Canadian goverment a permit, expiring in March 1960, giving the firm a right to convert to a lease on potash reserves. The permit requires the spending of $3 million in the next three years. If that amount is not spent in development, the land will have to be surrendered to the government.

To date, National apparently hasn't decided whether or not to follow through with a mine program. Much no doubt depends on future attitudes of the Canadian government. There's some talk that government officials are worried about pushing in too many potash producers, too fast, and forcing overcapacity.

If the Canadian government changes its views, doesn't push rapid development, National for one might choose to forestall mine development.

Ivan's Potash Ruckus: Considerable controversy has been stirred up in recent weeks by hints that Russian potash will soon be imported to the U.S. by the Jay-H Co. (St. Louis). Praise for the quality of Russian potash by the firm's President A. W. Jacobs *(CW, June 13, p. 77)* has some U.S. potash interests bristling; Jacobs' claim, that Russian material can be priced competitively with Carlsbad potash if it's brought in by the St. Lawrence Seaway, is hotly debated.

Key to the pricing controversy lies in Russia's primary purpose in marketing potash in the U.S. (assuming that such interest exists). Is it to make money or reap political-economic advantage?

On a strictly out-to-make-money deal, Russia appears to be in a poor competitive position. As some U.S. marketers point out, there are few fertilizer plants located at Seaway ports and Russian potash would still have to be shipped across country, thereby adding to its cost.

But if Russia is willing to sell potash here at break-even prices—or perhaps even at a loss—the story could be quite different.

Disruption of the U.S. agricultural scene and undermining of this country's militarily important potash industry are viewed as possible "reasons" for sale of Russian potash in the U.S. The market overtures for

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Russian potash are also tied in with recent discontinuance of East German potash exports to the U.S. *(CW, July 4, p. 64).*

Among reasons advanced for the discontinuance is that East Germany has adequate potash markets at home and in nearby areas; another is that a reallocation of potash markets is taking place between East German and Russian producers, and that East Germany is relinquishing U.S. markets to ease entry of Russian potash.

Speculation aside, three points appear certain. Jacobs' assertions of his intent to sell Russian material here has a ring of assurance; U.S. observers won't be convinced of the Russian potash competitive potential until ships dump it here; if it piles up here, there will be active campaigning for tariff protection or quotas.

Undaunted by the industry's skepticism and warnings of a tariff fight, Jacobs reportedly told trade observers a few days ago that he and others were completing a deal involving Russian potash that "would open some eyes."

Price Policy Change? Despite the increasingly complex competitive situation developing in the potash industry, at least one U.S. producer is predicting higher prices—but not yet.

Prices of powdered standard and coarse-grade muriate are expected to remain fairly constant for the next couple of years, then increase. Tabs on granular material are expected to climb in July '60 (reportedly would have done so this year except that one producer promised to hold at '59 prices and others followed suit).

The expectation of higher potash prices in the future does not, however, imply that potash supply/demand balance will necessarily change for the better. Rather, the expected increases are predicated on a growing producer awareness that prevalent pricing tactics aren't paying off. Promise of lower prices for bigger contracts has been widely practiced; but it hasn't paid off in the long term, because other producers quickly match any low prices.

But there is now no real assurance that all producers are willing to sacrifice the fatter short-term contract for the long-term good of the industry. And there's no big use in sight that will sop up the increasing overcapacity that faces the industry.

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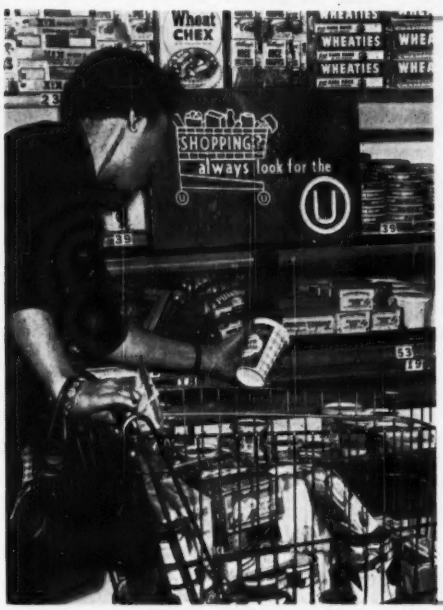
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About 2,000 Jewish congregations and 20,000 individuals received the June issue of the monthly Orthodox Union News Reporter, informing them that two more specialty items, Procter & Gamble's Mr. Clean and Pam Industries Inc.'s Pan Dry Fry, have received rabbinic endorsement, and now carry the union's symbol of approval.

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Knowing something about kosher restrictions—and observing some simple points relative to ingredients in products—could open up markets now closed to some specialty makers.

Who's Affected: Specialty makers who stand to gain most are (1) those either making ingredients—such as emulsifiers and stabilizers—for food and medicinal products or (2) those that supply the cleaning products used either by the Jewish housewives or the manufacturers turning out kosher items. It's not enough that certain materials be kept out or not mixed together in kosher products; the equipment used in cooking or blending these items must be cleaned in a prescribed manner—with kosher cleaning materials.

In brief, a product that is kosher (which means fit or proper) is one that contains no ingredient forbidden by Jewish law as well as one that is not processed with nonkosher equipment. Dietary law adherents can eat meats from animals* that have split hooves and chew their cuds, fish that have fins and easily removable scales. And these can be eaten only if slaughtered and prepared in a certain way.

Derivatives of nonkosher animals and fish—e.g., tallow for soap and liver extract from sharks—are also forbidden by the laws. In addition to those restrictions that hold during the entire year, there are certain additional dietary restrictions that apply only for the eight days of the Jewish Passover. During those days, fermentation products and certain grain-derived products (e.g., corn starch) are forbidden in the diet. Even aspirin that uses a corn starch binder cannot be taken during this period. Products made for Passover use must be separated from those made for non-Passover periods.

A specialty cleaning material to be considered kosher must not contain emulsifiers, stearates, defoamers, fatty acids, etc., which are derived from any of the animals forbidden by Jewish law. Nor can those products be made in equipment in which nonkosher products are also made, unless the equipment is first made kosher—e.g., washed with boiling water, then left idle for 24 hours.

Drugmakers must watch their ingredients, too, if they want to obtain the symbol of approval, signifying a product's acceptability. Natural gelatine, glycerine, some vitamins, certain flavors, and stearates can make a drug item tabu.

Dietary laws regarding drugs are not as rigid as they are about food. If a person's health is seriously concerned, all dietary laws are suspended.

One company, the Freeda Pharmaceutical Co. (New York), has done a tidy business turning out aspirin and vitamins designed specifically for the

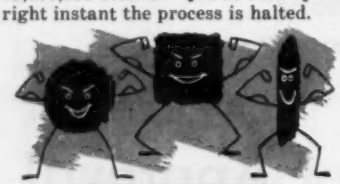
*Nonkosher livestock include pigs, predatory animals and any not slaughtered by prescribed ritual. The animals must be butchered by a shochet (a ritual slaughterer) using a chalef (a special knife without nicks or other defects). Nonkosher fish include lobster and other shellfish, catfish, eel, squid, swordfish and shark. Most domestic fowl are kosher; some 24 birds, such as hawks and seagulls, are not. All insects and reptiles are nonkosher.

COLLOID CORNER



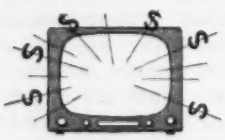
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market for kosher pharmaceuticals.

How to Get Approval: A firm wishing to get its product approved as kosher can go to a local orthodox rabbi for certification. Those companies having products designed for more than local trade, however, would contact the Orthodox Union, as the Union of Orthodox Jewish Congregations of America is commonly called. Its certification program, 33 years old, is the only one recognized on a national and international plan.

With the movement away from the tight orthodoxy that once characterized Jewish communities, it's not as easy as it once was to beam things at a "kosher" market. In the U.S., New York could once be considered the single large Jewish market. Today there are now many cities with large Jewish populations. Chicago has almost 300,000 Jews, Los Angeles almost 400,000; Philadelphia, 350,000; San Francisco, 55,000; Hartford, Conn., 26,000. Decentralization has given rise to the need for a nationally recognized product certifying agency such as the Orthodox Union.

Who Gets the Symbol: Getting the Orthodox Union's approval for use of the symbol isn't easy. A firm wishing to put it on its product label usually contacts the Orthodox Union and receives an application in return. This application asks, among other things, for a listing of all ingredients used in the product, along with those used by the suppliers. In addition, there are a series of questions dealing with the equipment in which the product is made, the method of cleaning the equipment, and the products used in the cleaning.

The answers to these questions go to Rabbi Alexander Rosenberg, rabbinic kashruth administrator of the Orthodox Union. He takes the application—under a code name to protect the sponsoring company's trade secrets—before a rabbinic commission. The commission decides if the product, as then manufactured, is kosher and determines the amount of inspection necessary to ensure adherence to the dietary laws.

Plants Checked: No products, according to Rabbi Rosenburg, are acceptable on the basis of the application alone. The plant where the product is made is always checked by the group. In some cases a representative of the Orthodox Union is stationed full-time inside a plant to see that the product is made in accordance with Jewish laws. P&G has a full-time representative (for detergents and shortenings), as does Dow (for synthetic glycerine and propylene glycol production) and Shell Chemical Corp. (synthetic glycerine and synthetic ethyl alcohol). The manufacturer pays the Orthodox Union for that group's out-of-pocket expenses for supervision.

Marketing Advantage: There is a marketing advantage to having the kosher label, of course. The Kosher Products Directory for Summer '59 lists 24 cleaners, 41 detergents, several dry bleaches, 10 industrial cleaners, along with several listings each for silver polishes, corn starch, emulsifiers, flavor improvers, and medicines. Among the companies listing products are Colgate-Palmolive, P&G, Lever Brothers, B. T. Babbitt, Purex Corp., Glamorene, Inc., Brillo Manufacturing Co., Glyco Products Co., Shell Chemical Corp. and Dow Chemical.

Even if a firm's product is calculated to be used by only half of the Jews in the U.S. and Canada, there's an advantage to having the symbol. Manufacturers here are in competition with relatively few firms.

Many specialty makers now have products that can go into the kosher market without the need for any ingredient or process change. It could be a symbol of sales know-how to have a product marked acceptable by a kosher certification group.

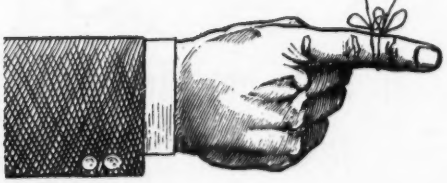
Not As Sweet

The sweet smell of success turned a bit sour for U.S. makers of flavor and perfume materials last year. Sales of these materials were down 4% from '57. In its preliminary report on U.S. production of flavor and perfume materials, the U.S. Tariff Commission noted that U.S. production of those materials amounted to 43 million lbs. in '58. Sales amounted to 39 million lbs., valued at $52 million ('57 figures: 42 million lbs.; $59 million).

Production of cyclic flavor and perfume material in '58 totaled 25 million lbs.—off 7% from '57. Sales of cyclic flavor and perfume materials were 21 million lbs., valued at $31 million ('57 figures: 22 million lbs.; $36 million). Top item in the

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Decatur, Alabama

SPECIALTIES

cyclic group, volumewise, in '58 was methyl salicylate (3 million lbs.). Output of synthetic sweeteners, including derivatives of cyclohexane-sulfamic acid and saccharin, totaled 2 million lbs., valued at $4 million.

The output of acyclic flavor and perfume materials in '58 amounted to 18.4 million lbs.—about the same as in '57. Monosodium glutamate was among the most abundant materials turned out, production totaled 17.7 million lbs. Sales of acyclic flavor and perfume materials in '58 was 19 million lbs., valued at $21 million ('57 figures: 20 million lbs.; $23 million).

EXPANSION

Colgate-Palmolive Co. (New York) has made arrangements to acquire Sterno Corp. of New York, maker of canned heat. It will bring another $2 million in sales to the C-P complex, according to trade sources.

•

Baugh and Sons Co. (Baltimore, Md.) has bought the inventory and tradenames of I. P. Thomas Division of Dixon Chemical Industries Inc. It takes Dixon out of the fertilizer business, gets Baugh and Sons deeper into it.

•

L'Oreal of Paris has started production of a line of hair dyes and cosmetic products at Hamilton, Ont., Canada.

•

Tremco Manufacturing Co. (Cleveland) has opened a new, $1.5-million research center and administrative office building in the Shaker Heights area of Cleveland. About 110 people staff the building.

PRODUCTS

Hydraulic Fluid: Sun Oil Co. (Philadelphia) has a new water-in-oil emulsion-type hydraulic fluid called Sunsafe. It has a viscosity index of 130, is claimed to be useful at pressures up to 2,000 psi., temperatures up to 150 F. The fire-resistant fluid is available in two grades—one for industrial machines and systems; the other for use in mining machinery.

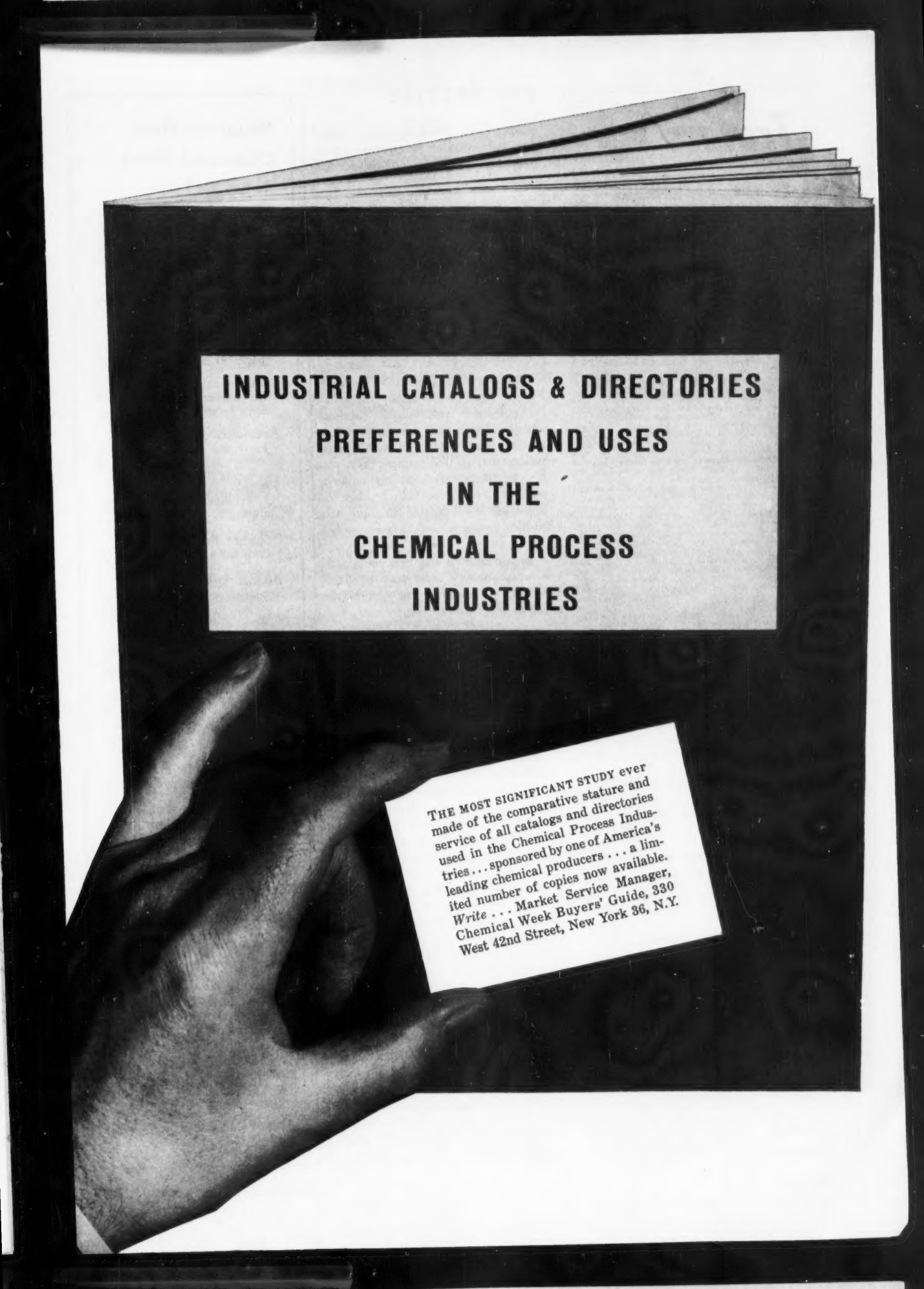
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Plastic Window Cleaner: Schwartz Chemical Co. (50-01 Second St., Long Island City, N.Y.) is offering a liquid



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Chief Chemist—Rapidly growing heavy chemical manufacturer in North Jersey has an opening for a Chief Chemist preferably with sulfuric acid experience. Advancement opportunities available. All replies confidential. P-1924, Chemical Week.

Development Engineer: Excellent opportunity for young graduate engineer with 2-3 years Process Development experience to join our expanding Nuclear Fuels Department. Previous nuclear fuels experience desirable but not essential. This is a challenging position as a development engineer, encompassing a broad area of nuclear fuels technology and offering the opportunity for future advancement. In reply, please send complete resume of experience, education, age and salary desired to: Personnel Manager, Spencer Chemical Company, 610 Dwight Building, Kansas City 5, Missouri.

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Not Advancing Fast Enough? Need assistant to overburdened president of rapidly-growing established small chemical company. Business acumen a must, market research helpful. Tough interesting job, commensurate pay. Send resume to Aceto Chemical Co., Inc., 40-40 Lawrence Street, Flushing 54, New York.

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SPECIALTIES

cleaner and polishing agent, called Rez-N-Polish, for transparent plastic panels. It's supplied in 8-oz. squeeze bottles.

•

Adhesive: Chrysler Corp.'s Cycleweld Chemical Products Division (Detroit) is marketing a new adhesive called Liquid Iron. The material will form a bond, according to the company, that will retain its strength from 0 to 300 F, will bond iron, bronze, wood, aluminum, brass, porcelain, marble, glass, etc.

•

Stabilizer and Thickener: Hercules Powder Co. (Wilmington, Del.) has brought out a water-soluble stabilizer and thickener for possible application in water-based emulsion paints, paper coatings and sizings, inks, etc. It's called Natrosol, is a nonionic, water-soluble hydroxyethyl ether of cellulose. It's available in four viscosities.

•

Shampoo in a Bag: Helene Curtis (Chicago) is now marketing its Shampoo Plus Egg in a one-shot plastic bubble package for 12c.

•

Polish in a Pad: Met-L-Glo, a chrome-, copper- and brass-cleaner incorporated into a pad is being offered by Hahn Co. (2311 Fox Hills Dr., Los Angeles). Price: $1 for a can of 10 pads.

•

Enzyme: Klerzyme, an enzyme product for the hydrolysis and polymerization of pectin-containing materials, is now being offered by Wallerstein Co., division of Baxter Labs Inc. (Mariners Harbor, Staten Island, N.Y.). It comes in three grades.

•

More Dry Bleach: Monsanto Chemical Co. (St. Louis, Mo.) has added a new item to its line of chlorinated cyanuric acids. The product, called ACL-59, is the potassium salt of dichloro-isocyanuric acid. It's said to offer exceptional stability.

•

Labeling Primer: Fairfield Chemicals, division of Food Machinery and Chemical Corp. (New York), is offering a condensed facts-folder, which gives formulations, label suggestions for pyrethrin-containing products, and contains a glossary of chemical and trademark names to guide in the preparation of labels.

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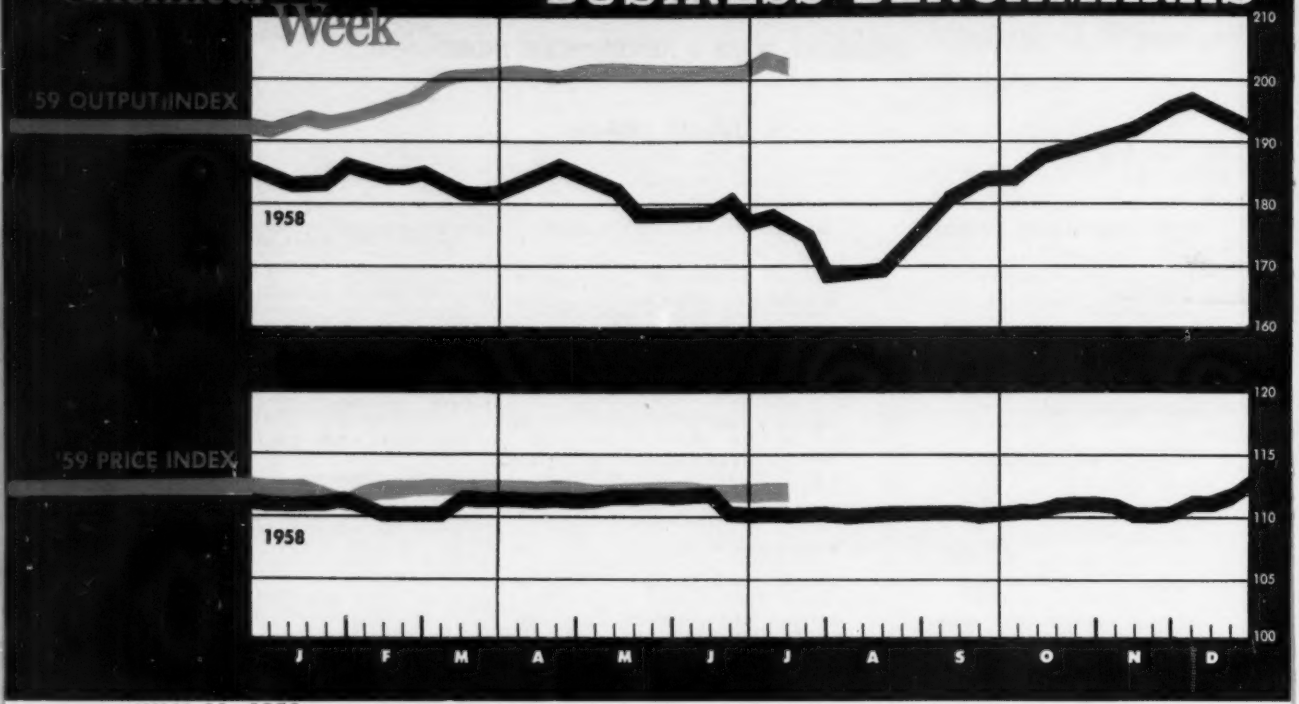
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Chemical Week

BUSINESS BENCHMARKS



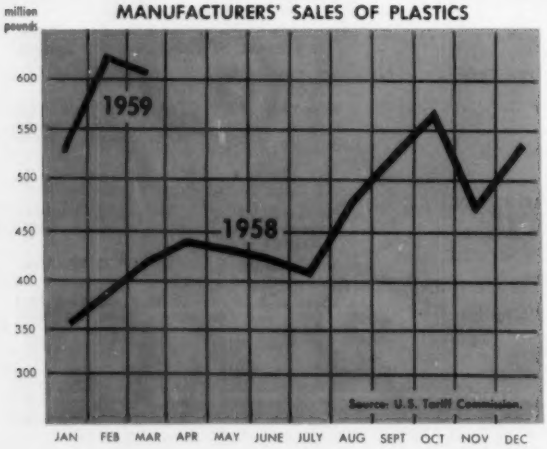
JULY 11, 1959

WEEKLY BUSINESS INDICATORS	LATEST WEEK	PRECEDING WEEK	YEAR AGO
Chemical Week output index (1947-1949=100)	202.5	204.0	168.0
Chemical wholesale price index (1947=100)	111.9	112.0	110.6
Stock price index (11 firms, Standard & Poor's)	58.67	57.83	40.66
Steel ingot output (thousand tons)	2,400	2,486	1,376
Electric power (million kilowatt-hours)	13,749	13,331	11,757
Crude oil and condensate (daily av., thousand bbls.)	7,025	7,016	6,373

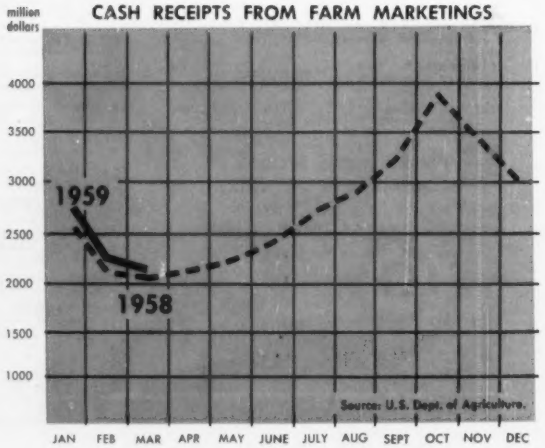
MONTHLY INDICATORS—Production (1947-1949=100)	LATEST MONTH	PRECEDING MONTH	YEAR AGO
All manufacturing	155	153	130
Nondurable goods manufacturing	143	142	126
Durable goods manufacturing	168	164	134
Chemicals and allied products	206	203	178
Industrial chemicals	230	227	182
Petroleum and coal products	143	148	129

PROCESS INDUSTRIES CLOSE-UP

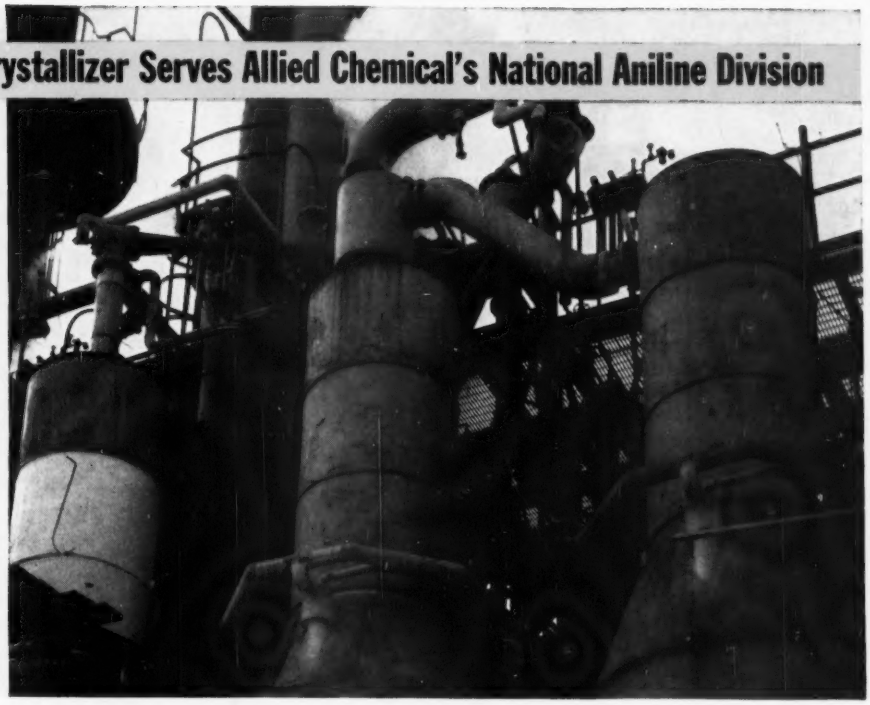
MANUFACTURERS' SALES OF PLASTICS



CASH RECEIPTS FROM FARM MARKETINGS



Another CB&I Crystallizer Serves Allied Chemical's National Aniline Division



CB&I crystallizer system produces high purity, highly uniform adipic acid crystals for use in synthetic fibers at the Hopewell, Va. plant of National Aniline Division. Is one of several CB&I-built systems used by the company.

Three-stage system produces high purity adipic acid crystals

The chemical industry demands—and gets—uniform, high purity adipic acid crystals from the Allied Chemical's National Aniline Division plant at Hopewell, Virginia.

Here, a CB&I-built three-stage crystallization system *twice* re-dissolves the crystalline crop to remove impurities. Then the system's third effect produces the final *quality* crystals required as raw material for the chemical industry.

Fabricated of type 304L stainless steel to resist corrosion and to prevent iron contamination, the crystallizer system has been in continuous service for three years.

Dependable, profitable performance such as this is one reason so many CB&I crystallizer-evaporator customers—become repeat customers for CB&I processing vessels, which include: Crystallizers • Evaporators • Flash Evaporators • Condensers • Heat Transfer Equipment • Digesters • Vaporizers • Vacuum Dryers • Boiler Feed Water Equipment



Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston • Kansas City (Mo.)
New Orleans • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • South Pasadena • Tulsa
Plants in Birmingham • Chicago • Salt Lake City • Greenville, Pa. • New Castle, Delaware
SUBSIDIARIES:
Horton Steel Works Limited, Toronto; Chicago Bridge & Iron Company Ltd., Caracas;
Chicago Bridge Limited, London; Chicago Bridge Construcoes Ltda., Rio de Janeiro
REPRESENTATIVES AND LICENSEES:
Australia, Cuba, England, France, Germany, Italy, Japan, Netherlands, Scotland

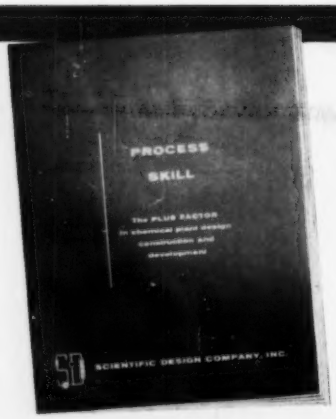
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FOREMOST IN CHEMICAL PLANT
DESIGN • CONSTRUCTION • DEVELOPMENT

NEW TECHNOLOGIES through SD's Process Skill

SD now offers, alone or in cooperation with other companies, such processes as:

- **Isoprene**
- **Adipic acid**
  from cyclohexane
- **Cyclohexanone and Cyclohexanol**
  from cyclohexane
- **Vinyl acetate**
- **Polyethylene**
  by high pressure synthesis
- **Formaldehyde**
  from methane
- **Methyl ethyl ketone**
- **Phthalic anhydride**
- **Acetic acid**
- **Acetylene**
- **Ethanolamines**
- **Ethylene oxide-glycol**
  (new 1960 model)
- **A number of other new and interesting processes and products**



NEW SD PROCESS SKILL BROCHURE Just Off the Press!

Write on your business letterhead for SD's new Process Skill Brochure. It tells why this vital PLUS FACTOR is essential in today's and tomorrow's chemical industry . . . how your company can profit by its application . . . how SD has applied its unique *chemical process skill* to chemical plant, design, development and construction throughout the world.

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